To: Timothy Fisher[tjfisher@blm.gov]; Rachel Wootton[rwootton@blm.gov]
From: Ginn, Allison
Sent: 2017-06-01T15:59:39-04:00
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Subject: Re: GSENM - Zip Folder
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5-19-17 Follow Up Response GSENM_2.zip

Regards,

Allison Ginn
National Conservation Lands Program Lead
BLM Utah State Office
801-539-4053

On Thu, Jun 1, 2017 at 1:58 PM, Ginn, Allison <aginn@blm.gov> wrote:

For re-uploading ease.

Regards,

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Ethnographic Assessment of Kaibab Paiute Cultural Resources In Grand Staircase-Escalante National Monument, Utah

Ethnographic Assessment of Kaibab Paiute Cultural Resources in Grand Staircase-Escalante National Monument, Utah

Prepared for

Kaibab Paiute Tribe
Kaibab Reservation
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and
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This report has been prepared at the Bureau of Applied Research in Anthropology (BARA) at The University of Arizona, Tucson, Arizona. The study was greatly facilitated by BARA staff Maria Rodriquez and Armando Vargas. The study was fully support by the acting director of BARA, Dr. James Greenberg. Maps for the study were produced by the Center for Applied Spatial Analysis (CASA) in College Social and Behavioral Science at The University of Arizona. Director Gary Christopherson and his colleagues and research assistants, Pat Barabe and Peter Johnson, provided particular assistance.

Foreword

This report is based on interviews with Southern Paiute representatives from the Kaibab Paiute Tribe, who in this study represent all of the Southern Paiute people. The ideas of Kaibab Paiute people who have participated in this study have been contextualized and supplemented by archaeological findings, the ethnographic field notes of Isabel Kelly (site reference), archival research, extensive GIS mapping of the Grand-Staircase-Escalante NM, and an initial ethnobotanical inventory of particular sites and areas.

NM

The Southern Paiute people know the Creator placed them in their Holy Land, of which a portion includes lands found within Grand Staircase-Escalante/ Creation established a birthright bond between the Southern Paiute people (and all their generations to come) and the natural resources of this environment. These natural resources are perceived to be alive – capable of speaking to Paiute people, willing to give life to them, and manifest with human-like personalities. The relationship between these people and the natural resource of their Holy Land is governed by two basic premises: first, all things are alive and specially connected in ways that hold the world together. Secondly, since Creation these Paiute have used and protected the natural resources of their Holy Land through the guidance of cultural principles that emphasize mutual respect and responsibility. For these many thousands of years since creation the land and resources have been shaped and preserved by these culturally appropriate behaviors.

Before Europeans arrived with their diseases and domestic animals, the idea of their existence spread out ahead of them, causing both physical and psychological change. This is not surprising because the same physical and psychological events occurred to Europeans and their lands.

The arrival of Euroamericans resulted in devastating outcomes for the Southern Paiutes and eventually forced their removal from the lands currently held by the Grand Staircase-Escalante National Monument. Competition over physical and ideological terrains led to a massive loss of life amongst the Southern Paiutes, the loss of critical ancestral lands and resources necessary for survival, and the modification of social structures. A new history was placed on theirs – moving them from the people who should be there because Creation had placed them there to the people who should be moved away to make room for a new people chosen by God to live on the same land. Collectively these impacts, both physical and cultural, form an historic foundation that must be understood when considering the present consultation with Grand Staircase-Escalante NM.

Today, the Southern Paiute people who live in northern Arizona (the Kaibab Paiute and San Juan Paiute Tribes) and the five tribes reorganized as the Paiute Indian Tribe of Utah who live in southern Utah (Koosharem, Kanosh, Cedar City, Indian Peaks, and Shivwits tribes) remain connected to the places where they traditionally and aboriginally lived. This study begins

to define those places and connections with the Grand Staircase-Escalante NM. At this point in the consultation, and thus the focus of this study, are the members of the Kaibab Paiute tribe who are pleased to be involved in this first of a series of Southern Paiute studies.

Study Goals

The goal of this study is to convey in a systematic and readable fashion Southern Paiute perceptions of cultural resources in the Grand Staircase-Escalante NM. This study details the physical, prehistoric, historic, and cultural ties between the Southern Paiutes and these ancestral lands. In addition, we present the current relations of Southern Paiutes to this cultural landscape and the ways in which resource appropriation from the past continues to impact expressions of power in the present.

This report must serve two rather distinct purposes. First, the findings from this study will be used to supplement the official Environmental Impact Statement (EIS) for the Grand Staircase-Escalante NM. Special summary sections have been prepared in this report in order to help fit most directly with the EIS. Secondly, the report represents a first step in identifying Southern Paiute cultural resources located in the monument. This report contains a number of background sections which should be useful in explain the findings to tribal governments, the monument land managers, and others.

Tiering

The Federal government requires that research being prepared for an EIS and land management not unnecessarily duplicate previous studies. This is a process called **tiering**, which involves building one study upon another to reach a conclusion regarding what resources are present in the potentially affected environment and what impacts to those resources may result from the proposed project.

This report meets the Federal tiering requirement by (1) using background essays produced elsewhere and (2) contextualizing some findings with reference to previous studies in the region. The source is clearly referenced whenever tiering is used to clarify particular points in this report.

The Indian Study Area

Indian people often perceive their traditional cultural resources as an essential part of larger cultural resources. Archaeologists, for example, often view local sites as being imbedded in a set of interrelated sites in what are technically called *archaeology districts*. Similarly, studies of falcons may extend to wherever they hunt during nesting times, rather than being restricted to where the nests are located. Indian people, too, view specific traditional places and cultural resources as a part of larger, more abstract units of culture, which are often referred to as ***cultural landscapes***. For this reason, Indian people interviewed during this project talked about bigger areas whose connections with the Grand Staircase-Escalante study area shed light on the meaning of both near and far places. The American Indian study area for the Grand Staircase –

Escalante Ethnographic study is perceived as being as large as the sum of places that are culturally connected.

Spelling of Indian Names

This report uses Indian names wherever possible. There has not been an attempt to resolve the spelling of all Indian names. Different spellings of the same word appear because they were different in previously published texts and because the ethnographers conducting the interviews used different renderings of the words they heard. The development of a common spelling for all Indian names is currently beyond the scope of this study.

GIS Map

The GIS map was produced and made ready for use in the field. Local place names were added to the map so that each person using the map can readily understand which places are being represented. The preliminary use of the GIS map should be seen as an initial field test, and new application of this technique will be refined in future studies.

Access Data Base

The Microsoft ACCESS databases for the site and cultural landscape forms were modified to fit the study. These databases will serve as a foundation for preserving and updating findings derived from future studies.

Accomplishments

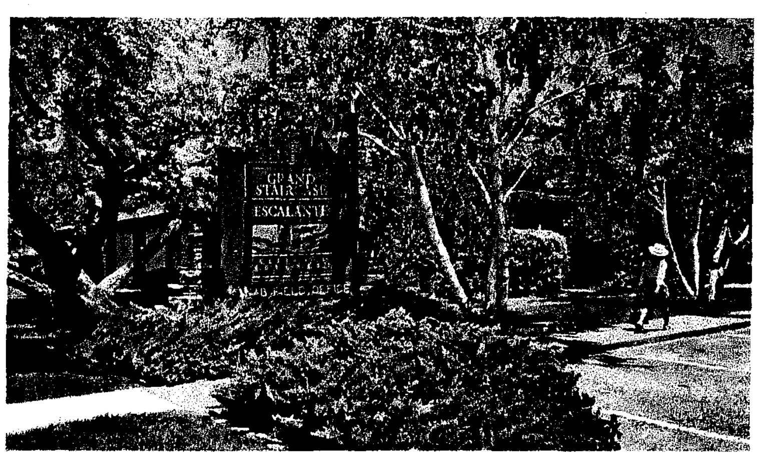
There are accomplishments that have moved the Kaibab Paiute study towards its desired goals. These include a rather extensive search for new documents and a beginning essay designed to set the stage for more fine-grained local history to be produced about the study area itself. The GIS database is expected to make the spring site visits extremely useful for representing Kaibab Paiute views on how the land and particular places within the Grand Staircase-Escalante NM are interconnected. Microsoft ACCESS databases provide a computer-based resource to receive the thoughts of Indian people and to present these thoughts in rich detail while telling their story with numeric clarity.

Chapter 1
Study Overview

The purpose of this chapter is to provide the reader with some understanding of this research project, including sources of funding, points of project management, and the participating American Indian tribes and researchers. Study methods are explained in detail, including site selection criteria, interview forms used in the field, and the processes of data coding and analysis.

Brief Description of the Project

This is an American Indian ethnographic study of the Grand Staircase-Escalante NM. This is the first report of activities conducted by the University of Arizona (UofA) regarding Kaibab Paiute ethnographic resources currently within the boundaries of the Grand Staircase-Escalante National Monument (GSENM). The Kaibab Paiute people were one of a number of Southern Paiute districts of the Southern Paiute nation who traditionally and aboriginally occupied and used the biotic and abiotic resources of this area. The term "ethnographic resources" is used in this report to refer to all things that are culturally special to the Kaibab Paiute people. More specifically, the term refers to the contemporary cultural meaning of physical places, artifacts, plants, animals, water, minerals, and air. Such biotic and abiotic resources are transformed by use and perception as central aspects of Kaibab Paiute culture. The moment of transformation may have been when these people were created in this land, during the thousands of years they have occupied and used resources, or during recent times as a product of ceremonial activities.



The study is being funded by the GSENM through a direct contract with the Kaibab Paiute tribe. A further subcontract between the Kaibab Paiute tribe and the UofA specified a number of tasks to be accomplished. These include the following:

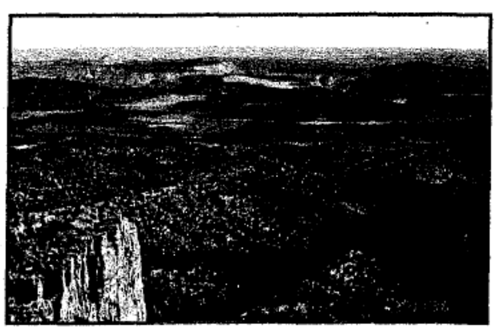
1. To compile documents relevant to the **historic use**[1] of the study area by members of the Southern Paiute nation – specifically people from the Kaibab District. This will include
    - A regional history that uses available published and archive materials and
    - Is open-ended so that future studies can more fully develop emergent lines of study.

2. To facilitate **systematic ethnographic interviews** within a portion of the GSENM. These interviews will be
    - Conducted with persons selected by the Kaibab Paiute tribe.
    - Occur only within areas identified as primary occupancy and use areas by the people of the Kaibab Paiute District.

3. To **prepare a report** that will
    - Summarize the findings of this research.
    - Identify ethnographic resources that should be considered for special Indian uses and agency management attention.
    - Design living databases that meet the mutual (tribal and agency) needs for shared and confidential information about these ethnographic resources.

Study Area

The Grand Staircase-Escalante National Monument is a very large area that has been carved out of some of the most topographically and ecologically diverse lands in North America. As such, one can expect that it will require many studies to more fully understand what there is in these lands that is culturally significant to American Indian people.



1 There were not sufficient funds for an historic use study so the UofA team has agreed to provide one with their own funds. For this reason this essay will involve a combination of materials written for other purposes as well as original research on the local area.

What we do know at this time is that the Southern Paiute people believe they were created in these lands, that they have lived here continuously since creation, that they were the aboriginal inhabitants of the land when its title was assumed by the United States, and that they continue to have cultural ties to these lands despite removal from some areas. It is also understood that Southern Paiute people as an ethnic group owned and occupied these lands traditionally, aboriginally, and historically[2]. The Southern Paiute nation, to use a contemporary term, was composed of semi-autonomous local groups, which are referred in this study as districts. Many of these districts have been converted into autonomous political units that the US government officially organized and recognized as tribes. One of these tribes, the Kaibab Paiute tribe, is involved in this study.

The U.S. Government frequently defines cultural affiliation[3] at the ethnic group level. However, actual consultation is done on a government-to-government basis with the tribes. It is the expressed wish of the Kaibab Paiute tribal government that this study be primarily restricted to the portions of the national monument that overlap with the traditional and aboriginal lands of the Kaibab Paiute tribe. This procedure permits and encourages the GSENM to establish appropriate and separate consultations with other Southern Paiute tribes who are most directly connected with portions of national monument. While this procedure is culturally appropriate, politically respectful, and reflects the level of funding available to do this study, the Kaibab Paiute Tribe maintains that eventually long term consultation should be established between the GSENM and a consortium of Southern Paiute tribes.

The UofA has provided a study area map, which defines portions of the GSENM that the Kaibab Paiute tribe wishes to study. This area is defined as where the aboriginal district boundary of the Kaibab Paiute people overlaps with the GSENM. The tribe retains the right to broaden the area of study at the specific request of elders and tribal representatives who identify cultural resources that exist elsewhere, but the GSENM area is the preferred focus of this study.

Legislative Context

Government-to-government relationships between Native Americans and Federal agencies frequently concern the study, protection, and preservation of cultural resources. This section describes the Federal laws governing the management of those resources.

Environmental Policy Act

The National Environmental Policy Act (NEPA, PL 91-190, 42 U.S.C. 4371, 40 CFR 1500 et seq.) requires completion of an EIS for any Federal action determined to have potentially significant environmental impacts. Relevant to the purposes of this study, NEPA encourages the preservation of historic resources and requires consideration of social impacts. A report from the

2 Traditional means from creation until Europeans arrived in the New World, aboriginal means when the lands were taken officially by the United States government, and historic means anytime a written record was established in the area (see Sutton 1985). See Appendix A for use of these three terms.
3 The concept of cultural affiliation as used in Federal government tribal consultation has been discussed at length in a Department of Defense report edited by Vine Deloria, Jr. and Richard Stoffle (1998). The report *Native American Sacred Sites and the DOD* is available in the DOD Indian web page - http://osiris.cso.uiuc.edu/denix/Public/Native/native.html

Council of Environmental Quality specifically directs the solicitation of input from affected Indian tribes at the earliest possible time in the NEPA process (40 CFR 1501.2). In the process, the lead agency is also directed to invite the participation of any affected Indian tribes in the scoping process. In addition, state, and local agencies or other interested persons should be invited to participate in this process (40 CFR 1501.7). The agency preparing the draft EIS is also directed to request the comments of Indian tribes on what effects there may be on their reservation (40 CFR 1503.1). However, the NEPA legislation also clearly indicates that in cases where project impacts are entirely social or economic, no EIS is required regardless of the severity of those impacts. NEPA can be an effective means by which to incorporate Native American interests into National Park Service (NPS) planning, but concerns have been raised, including the possibility that non-artifactual cultural resources which are only considered under NEPA could be vulnerable to Freedom of Information Act (FOIA) requests, thereby eliminating protection of confidential site locations. In addition, NEPA requires documentation of impact but provides no real protection for any specific resource (Stuart 1979). These early concerns have been answered by other legislation and also addressed by specific policies of the implementing agencies. In the following passages we briefly review these laws and policies.

Early Historic Preservation Legislation

Concern for historic and cultural resources has been expressed in legislation throughout the 20th century. In 1906, the Antiquities Act (PL 209, 16 U.S.C. 431-33) authorized the President of the United States to declare landmarks, structures, and objects of historic or scientific interest to be recognized as national monuments. In addition, lands are to be preserved to aid in their protection. The Act also established the necessity of obtaining permits for the excavation of archaeological sites on public lands. On August 21, 1935, the Historic Sites Act (PL 74-292, 49 Stat. 666) provided for the preservation of historic American sites, buildings, objects, and antiquities of national significance and confirmed the role of the NPS as the Federal government's central agency for historic preservation. On October 26, 1949, Congress created the National Trust for Historic Preservation to receive donations of sites, buildings, and objects significant in American history and culture and to preserve and administer these for the public benefit. On June 27, 1960, Congress provided legislation for the preservation of historical and archeological data threatened by the construction of a dam (PL 86-523, 74 Stat. 220). This Act requires any agency of the U.S. involved in construction of a dam to give written notice to the Secretary of the Interior, who shall then order a survey to be conducted to ascertain whether the affected area contains historical and archaeological data, which should be preserved in the public interest. If indicated by the survey, the Secretary shall then see that the data be collected and preserved. The 1974 amendments to this Act (PL 93-291) added significant scientific and prehistoric data to the others, which would require notification and preservation in the public interest. The amendments also require consent of "public entities having a legal interest in the property involved."

National Historic Preservation Act

On October 15, 1966, the National Historic Preservation Act (NHPA, PL 89-665, 80 Stat. 915, 16 U.S.C. 470 et seq.) increased the scope of historic preservation as a public policy while also broadening the duties of the NRS (Connally 1986). The Act expanded the properties to be

preserved to include those significant in American history, architecture, archaeology, and culture (Section 101-2). This Act provides assistance to *states.* It also established the Advisory Council on Historic Preservation, whose duty it is to advise the President and Congress on matters relating to historic preservation. They were also charged with encouraging public interest and participation in historic preservation, and assisting state and local governments in drafting legislation relating to historic preservation. The Director of the NPS, or his/her designee, serves as Executive Director of the Council. PL 94-422 of September 28, 1976, amended Section 102 of the NHPA and established the National Historic Preservation Fund. The 1980 amendments to the Act directed the Secretary of the Interior to study the means of "preserving and conserving the intangible elements of our cultural heritage such as arts, skills, folklife, and folkways..." and to recommend ways to "preserve, conserve, and encourage the continuation of the diverse traditional prehistoric, historic, ethnic, and folk cultural traditions that underlie and are a living expression of our American heritage" (PL 96-515, 94 Stat. 2989, 16 U.S.C. 470a). The amendments provide explicit requirements for protecting confidentiality regarding the location of sensitive historic resources. They direct the head of any Federal agency to "withhold from disclosure to the public, information relating to the location or character of historic resources whenever...the disclosure of such information may create a substantial risk of harm, theft, or destruction to such resources or to the area or place where such resources are located" (Section 304). National Register Bulletin 29, *Guidelines for Restricting Information on the Location of National Register Properties*, provides full detail for agency directors.

The NHPA amendments also demonstrate the shift in U.S. policy toward the recognition of Native Americans. For the first time in historic preservation legislation, explicit mention of the Federal government's partnership with Indian tribes in the protection and preservation of prehistoric and historic resources is elaborated (Section 2). A report named *Cultural Conservation*, was prepared to respond to the directives of the Act and submitted to the President and Congress by the Secretary of the Interior on June 1, 1983 (Parker and King 1990). This report directed the NPS to prepare guidelines to assist in the documentation of intangible cultural resources. The National Register Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties* fulfilled that purpose with specific inclusion of Indian Tribes (Parker and King 1990:2). This bulletin is significant for the preservation of Native American cultural resources because the policies and procedures of the National Register can be interpreted by Federal agencies and others to exclude historic properties of religious significance to Native Americans, thereby excluding them from eligibility for inclusion in the National Register (Parker and King 1990:3). On October 1, 1985, a Joint Resolution recognized the 50 years of accomplishments resulting from the Historic Sites Act (PL 99-110).

On October 30, 1992, the National Historic Preservation Act was again amended to provide greater authority and assistance to Native Americans. The 1992 amendments specifically mention the need for Federal agencies to contact and consult with Indian tribes. Properties of traditional religious and cultural importance to an Indian tribe may be determined to be eligible for inclusion on the National Register, and a Federal agency must consult with any tribe that attaches religious or cultural significance to such properties. In addition, Indian tribes are to receive assistance in preserving their particular historic properties. Coordination among tribes, State Historic Preservation Offices (SHPOs), and Federal agencies is to be encouraged in historic preservation planning, as well as in the identification, evaluation, protection, and interpretation

of historic properties. Additional language is also included in the amendments regarding confidentiality, and tribes are eligible to receive direct grants for the purpose of carrying out this Act. The amendments provide state that tribes shall to assume part or all of the functions of an SHPO with respect to tribal lands.

In response to the 1992 NHPA amendments, the Advisory Council on Historic Preservation (ACHP) adopted a new policy statement on June 11, 1993 entitled "Consultation with Native Americans Concerning Properties of Traditional Religious and Cultural Importance". This policy provides explicit principles for the application of the amendments which include an amendment stating that Native American groups who ascribe cultural values to a property or area be "identified by culturally appropriate methods" and that participants in the Section 106 process should learn how to approach Native Americans in "culturally informed ways" (ACHP 1993:3-4). Consultation with Native Americans must be conducted with sensitivity to cultural values, socioeconomic factors, and the administrative structure of the native group. Specific steps should be taken to address language differences and issues, such as the seasonal availability of Native American participants. According to this policy, Native American groups not identified during the initial phases of the Section 106 process may legitimately request to be included at later stages in the process. The Advisory Council's policy statement also reaffirms the U.S. government's commitment to maintaining confidentiality regarding cultural resources and states that participants in the Section 106 process "should seek only the information necessary for planning" (ACHP 1993:3).

Archaeological Resources Protection Act

The Archaeological Resources Protection Act (ARPA, PL 96-95, 93 Stat. 712, 16 U.S.C. 470) was signed into law on October 31, 1979. It extended the protection of archaeological resources on Federal and Indian land. Archaeological resources are defined as the material remains of past human life or activities that are of archaeological interest, have retrievable scientific information, and are over 100 years old. Under ARPA, excavated resources remain the property of the U.S. government and are subject to inventory and repatriation in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA, see below). ARPA provides the first significant criminal penalties for the vandalism, alteration, or destruction of historic and prehistoric sites or for any transaction conducted with an archeological resource that was excavated or removed from public or Indian lands or in violation of state or local law (Section 6). The Act directs Federal land managers to notify any Indian tribe considering a site as having religious or cultural significance prior to issuing a permit for excavation or removal of archeological resources from the site. Section 9 restricts the release of information concerning the nature and location of any archaeological resource requiring a permit for excavation or removal.

In 1984, uniform regulations were promulgated as required by this Act, by the Secretaries of the Interior, Defense, and Agriculture, and by the Chairman of the Tennessee Valley Authority (43 CFR Part 7; Carnett 1991:3). Federal land managers may develop additional regulations as they become needed by their agencies. The January 25, 1988 amendments of the Act (PL 100-555 and PL 100-588) strengthened ARPA with requirements that Federal agencies develop plans for surveying lands not scheduled for projects.

American Indian Religious Freedom Act

Additional legislation, which affects tribes and cultural resources, includes the American Indian Religious Freedom Act (AIRFA) passed on August 11, 1978 (PL 95-341, 42 U.S.C. 1996). AIRFA reaffirms the rights of American Indian Peoples, under the First Amendment of the U.S. Constitution, to have access to lands and natural resources essential in the conduct of their traditional religion. In Section 2, Congress asks the President of the U.S. to direct various Federal departments and agencies to consult with native traditional religious leaders to determine appropriate changes in policies and procedures necessary to protect and preserve American Indian religious practices. The Act requires the NPS, like other Federal agencies, to evaluate policies and procedures with the aim of protecting the religious freedoms of Native Americans including "access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites." During the 12 years since Congress passed AIRFA, all Federal agencies have developed the means of interacting with American Indian tribes who have cultural resources potentially impacted by agency actions. The Bureau of Reclamation has established an Office of Native American Affairs that helps to facilitate interactions between tribes and facilities. The NPS has published specific policies concerning American Indians. These will be discussed at greater length below.

In 1994, U.S. Congress passed a number of amendments to AIRFA (U.S.C. 103D - Report 103-675). These amendments include provisions for protecting, in addition to sacred sites and objects, substances (plants, animals) that are needed for the practice of Native American religious rites and ceremonies.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA, PL 101-601, 104 Stat. 3048) became law on November 16, 1990. NAGPRA makes provisions for the return of human remains, funerary objects, and associated sacred items held in Federally funded repositories to American Indian, Native Alaskan, and Native Hawaiian peoples who can demonstrate lineal descent, cultural affiliation, or cultural patrimony. In addition, the Act requires for formal consultation with, and participation of, indigenous peoples to decide the disposition of these resources. This process should occur as a result of repository inventories and in the event that resources are encountered by activities on Federal and tribal lands (Price 1991:32-33).

According to a memorandum from the Executive Director of the Advisory Council for Historic Preservation (Bush 1991), NAGPRA will affect the Section 106 review process in at least three ways: (1) With regard to the conduct of archaeological investigations, formal consultation must occur with appropriate American Indian groups regarding the treatment and disposition of human remains and other cultural resources recovered during archeological studies on Federal and tribal lands, and tribes must give their consent to the excavation of human remains and removal of remains and other cultural resources from tribal land beyond that normally required of the Section 106 process; (2) In discovery situations, agencies are encouraged to develop plans to deal with the unexpected discoveries of archeological materials, and in the event of inadvertent discovery, all project activities must cease, the appropriate

Federal agency or Indian tribe must be notified, and activities must not resume for 30 days. Disposition will be resolved in accordance with the provisions set forth in NAGPRA; (3) With regard to curation, NAGPRA allows for the affiliated American Indian group to decide on the treatment and disposition of recovered cultural items. This goes beyond the ACHP policy that simply requires professional curation.

Executive Order 13007, Indian Sacred Land Executive Order

Executive Order 13007, *Indian Sacred Land Executive Order* (Clinton 1996) is also relevant to the preservation of American Indian cultural sites. EO 13007 directs federal land managers, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, (1) To accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, (2) To avoid adversely affecting the physical integrity of such sacred sites, and (3) To maintain the confidentiality of such sacred sites as appropriate. EO 13007 explicitly addresses sacred sites protection policies and requires consultation. This study also meets the requirements of Executive Orders 13083 and 13084, which regulate consultation with Indian tribal governments (Clinton 1998).

Concern for intangible cultural resources, particularly for Native Americans who identify locales of traditional importance that do not exhibit physical evidence of human behavior, began to be expressed by the late 1970s (Stuart 1979). The September 1984 keynote address by NPS Director Russell E. Dickinson to the First World Conference on Cultural Parks called for park officials to "seek innovative forms of rapprochement among native communities, government land managing agencies, and groups who share that concern. Working together requires recognition and respect, developing permanent working partnerships, recognition of the value of cultural differences, and recognition that culture means more than objects or structures (Scovill 1987). Natural and cultural features are now viewed as park resources associated with traditional subsistence, sacred ceremonial or religious, residential, or other cultural meaning for members of contemporary park-associated ethnic groups, including Native Americans (Crespi 1987). *Bulletin 38* was one NPS response to the need to evaluate and document *traditional cultural properties* (Parker and King 1990). The *Bulletin* is intended to supplement rather than supplant more specific guidelines such as those used by Indian Tribes (Parker and King 1990:3-4). The *Bulletin* provides guidance in conducting cultural resources surveys, noting the importance of background research about what is already recorded and consulting with persons who have been students in the cultures and traditions of the area under review. The agency conducting a cultural resources survey has the responsibility for coordinating and consulting with Indian tribes. Recommendations include making contact with knowledgeable groups in the area and specifically seeking out knowledgeable parties in the affected community outside the official political structure, with the full knowledge and cooperation of the contemporary community leaders (Parker and King 1990:6).

The NHPA, as amended, provides for the protection of traditional cultural properties as historic properties under Section 106 and is a new endeavor in cultural resources management (Parker 1993). A special issue of the NPS periodical, *CRM* (1993), was devoted to the topic. The July 1994 release of *NPS-28* defines *cultural landscapes* as complex resources including landforms, soils, and vegetation that are a reflection of human adaptation and resource use. It

specifies that, "all cultural landscapes are to be managed as cultural resources, regardless of the type or level of significance" (NPS 1994:93).

Cultural Affiliation and Involved American Indian Tribes

The first decision in any American Indian ethnographic assessment is to establish which American Indian ethnic groups are potentially culturally affiliated with the location(s) being studied. The term affiliation implies that the relationship between Native Americans and the land is cultural. There is no formula to define how long a people must live on land in order to establish cultural affiliation. In general, the length of time American Indian people have spent on the land varies from groups who perceive they have lived in an area since the beginning of creation to groups who have had a brief, but culturally significant experience on the land. When periods of time are chosen as the frames for viewing cultural affiliation, three broad divisions emerge: (1) Traditional period, (2) Aboriginal period, and (3) Historic period. It is important to remember that Native Americans may use other definitions of time, including a pre-human time which is without measure and essentially timeless. These periods of cultural affiliation are discussed in more detail in the next chapter.

The second decision in any American Indian ethnographic study is to identify the tribes culturally affiliated with the area under federal management. The Grand Staircase-Escalante NM at this point in time has not officially conducted a cultural affiliation study, however, in the process of putting together both their EIS and management plan, they have hypothesized the cultural attachment of the following cultural groups: the Hopi, the Zuni, the Navajo, the Paiute Tribes of Utah, the San Juan Paiute, and the Ute. This study serves to document the cultural affiliation of the Southern Paiutes and within that ethnic group the specific cultural affiliations of the Kaibab Paiute people.

The Bureau of Applied Research in Anthropology

The Bureau of Applied Research in Anthropology (BARA) is a unique research institution within the College of Social and Behavioral Sciences at the University of Arizona. As a research unit, BARA seeks to apply social science knowledge toward an enhanced understanding of real-world problems. Its diverse range of research activities in both domestic

and international contexts addresses critical human issues dealing with change and development, power and poverty, gender and ethnicity, growth and learning, social justice and equity, and environmental change and sustainability. At the heart of BARA's approach lies a commitment to community participation, empirical fieldwork, and innovative research methods. BARA bases its reputation on its ability to create effective dialogues with local stakeholders, to accurately document strategies of household and community, and to promote the economic wellbeing and cultural integrity of its partner communities. Building on its extensive field experience, BARA has developed and tested a research methodology that combines qualitative and quantitative techniques within a participatory framework.

Native American Cultural Resource Revitalization

This research is being conducted through the Native American Cultural Resource Revitalization (NACRR) program in BARA. Consistent with BARA's founding mission to monitor the welfare and wellbeing of Native American groups in Arizona, this program focuses on the national need to assure the preservation of Native American cultures and languages.

A long history of misguided policy-making and disregard for native cultures in this country has created a wide variety of cultural resource problems for Indian peoples. Recent legislation, such as the American Indian Religious Freedom Act of 1978, the Native American Graves Protection and Repatriation Act of 1990, and Executive Order 13007 - Sacred Site Access, has attempted to redress the situation and establish new policy paths that emphasize tribal empowerment and cultural respect.

BARA has contributed to these new directions by developing standard study procedures that assure the full participation of Native American tribes in the process of identifying and controlling their comprehensive cultural resource inventories. In this program, BARA research facilitates the interaction of tribes with government and private agencies. Through the use of ethnography, BARA professionals have assisted communities in reconstructing their cultural histories. In addition they have made Geographical Information Systems (GIS) technologies available to tribes wanting to identify and maintain their cultural landscapes, and have worked to address language shift through the development of dictionaries and the promotion of language literacy on reservations.

This program has also contributed to the development of cultural resource theory within applied anthropology and has generated genuine, mutually respectful and productive partnerships research programs. NACRR has received long-term funding from American Indian tribes, the NPS, the Department of Energy, the Department of Defense, and the Bureau of Reclamation.

Center for Applied Spatial Analysis (CASA)

The Center for Applied Spatial Analysis (CASA) at the UofA is a GIS research facility within the College of Social and Behavioral Sciences (SBS). CASA's mission is to facilitate the use of geographic information systems, spatial data, and related techniques (such as cartography, remote sensing, and spatial analysis) within the college. CASA supports and develops research projects and encourages the wider use of GIS and related techniques in the social sciences

through collaboration on grants, demonstrations, training, teaching and internships. CASA operates in the following areas:

- Research: Form research partnerships with faculty, staff and students within SBS. Perform GIS analysis for faculty and staff on a contract basis.
- Education: Participate in the development and implementation of core GIS curriculum at the University of Arizona. Provide formal and informal GIS training within SBS. Train research assistants and interns.
- Service: Develop and maintain libraries of social science spatial data and metadata. Develop custom applications to serve common data processing requirements in SBS, e.g., data subsetting, data normalization, and data delivery. Provide expert GIS assistance to faculty, staff and students within SBS. Provide access to GIS software and hardware (as space permits).

In this study, CASA customized a systematic mapping technique for recording cultural landscape data in a GIS layered format. The results of CASA's efforts appear in this report.

UofA Study Team UofA Study Team

The UofA provided academically trained persons to conduct all aspects of this project. These individuals brought various research skills, each of which was specially suited to this project. The following section briefly describes the study team.

Richard Stoffle, Ph.D.	Dr. Stoffle served as team leader for this project. In this capacity he oversaw all aspects of the research from the initial writing of the project proposal to submitting the final report. He is a long-standing member of the NACRR program in BARA.
Amy Eisenberg, M.S.	Ms. Eisenberg is a Ph.D. candidate in the Arid Lands Resources Sciences Program, UofA. Her dissertation involves participatory ethnoecological research with the Aymara Indians of the northern Chilean Andes. Amy is a botanist and botanical illustrator. She conducted interviews, coded data, and wrote text regarding the geography, fauna, and flora of each study site.
Alex K. Carroll, MA	Ms. Carroll was recently admitted to the graduate program in the Department of Anthropology, UofA. Her interests are Native American images in the professional literature and the process by which American Indian voices can appear in their own histories. She is currently profiling, from an Indian perspective, a Southern Paiute hero called Queho. Alex conducted interviews, coded data and wrote text on sites presented in Kelly (1971), as well as an ethnohistorical overview of the radical alterations that occurred with the

introduction of Spanish, Mexican, New Mexican, and Anglo influences into and through the GSE/NM.

John Amato, LPN — Mr. Amato is a Licensed Practical Nurse and professional photographer. He has recently worked with the Aymara Indians of the Andes photo-documenting impacts to their cultural resources. Mr. Amato took all the photographs associated with this study, coded data and edited text.

Chronology of Activity

This portion of the chapter presents a brief overview of activities related to this study. These activities are primarily focussed on The University of Arizona and do not fully represent those various activities accomplished by the cultural resource personnel of the Kaibab Paiute tribe who are under direct contract with the Grand Staircase-Escalante NM.

Spring 1999

University of Arizona became involved with this study at the request of the Kaibab Paiute tribe in the late fall of 1998. At the time when this study was being designed, the Grand Staircase-Escalante National Monument had just been established and both they and the Kaibab Paiute tribe were interested in developing a relationship centered on the cultural opinions of tribal elders. In addition, the Kaibab Tribe desired to uphold the tribal government responsibility in protecting the current cultural interests of the tribe and for future generations of Indian people. The Grand Staircase-Escalante National Monument study was further guided by various Federal cultural resource and natural resource laws including: the American Indian Religious Freedom Act of 1978, the Native American Graves Protection and Repatriation Action of 1990, Executive Order # 13007 regarding sacred site access, and Executive Orders #13083 and #13084 that specify how to consult with culturally affiliated tribes on a government-to-government basis.

In the spring semester a student seminar was convened to begin to review the documents associated with this study. Two students and Dr. Stoffle met once a week to discuss research strategies and review findings. The semester-long seminar was productive. The class developed an initial list of related early explorers, Mormon settlements, and local newspapers. Historic maps were found and added to the files. Microfilm containing early newspaper issues were received on inter-library loan and examined by the students. The seminar produced a document foundation for a time when data on specific topics would be needed in order to produce a regional and local history of Indian use and occupancy of the area.

Fall 1999

During the fall of 1999 UofA staff devoted time to designing a GIS map and GIS database that are to be used to collect, organize, and present information provided by the elders and tribal representatives during site visits. Sufficient historic data was procured so that portions of the study area could be entered into the GIS database.

The GIS database is to be used to produce a large size GIS field map. Tribal elders and representatives will mark these maps in order to illustrate their ideas of what exists locally and how these places/resources are connected with places/resources located elsewhere. These data will be coded into the GIS database in order to produce a composite GIS map.

The GIS map and GIS database are significant innovations in ethnographic methods. They have been developed as a part of this and another ethnographic study. They have just been used to successfully represent the cultural concerns for Mohave, Southern Paiute, Western Shoshone, and Owens Paiutes on the Nellis Air Force Base in southern Nevada. Given the success experience in that study, the UofA team is very optimistic regarding the use of GIS methods and products in the Kaibab Paiute study.

Spring 2000

In the spring semester of 2000, a UofA cultural anthropology graduate student worked a quarter time (but not on project funds) on documents under the supervision of Dr. Stoffle. She read local newspapers and copies of original U.S. Census forms for pertinent information. Dr. Stoffle began to acquire the diaries of U.S.G.S surveyors who initially provided field data for mapping the study area. Such diaries have proven useful in other projects providing original eyewitness accounts. New information is emerging from this effort.

Summer 2000

In the summer of 2000 the places and a schedule of the GSENM ethnographic fieldwork was negotiated with the Kaibab Paiute tribe who directed the UofA team to specific places and resources that should be the first to be studied. The Kaibab Paiute tribe made specific arrangements with Grand Staircase-Escalante National Monument regarding this study. Developing these plans required a two-day scoping task during which time many of the places and resources potentially involved in the study were visited by a scoping team from the Kaibab Paiute cultural resource office. Scoping assured the smooth working of the site visits and prevented endangering elders or missing key resources and places. It was hoped that the Grand Staircase-Escalante National Monument would want to provide an archaeologist (and perhaps a natural resource specialist) to participate in the site visits, but this was not possible.

Interviews centered around the major categories of cultural resources that have been identified by Kaibab Paiute elders and representatives in previous studies, which date back to the late 1970s. Systematic interviews were facilitated by the use of interview forms, which have been produced with the help of Kaibab Paiute elders on previous studies. These forms represent the range of questions that they perceive to be most useful. Two forms were used to record the majority of information: (1) The site-specific analyses form and (2) The cultural landscape form. Each form has been used previously and has an ACCESS database format ready for coding information.

We have included additional field data that was gathered to the extent that time permitted. This data briefly describes the geology and ecology of each location being studied. One of the members of the UofA team is a trained botanist whose primary role was to conduct

interviews, but additionally she was asked to provide lists of major plants at the site and help with the ecological descriptions. Issues that emerged during the field interviews stimulated the need for more visits to local archives.

Chapter 2
History: Creation to Restoration

In this chapter we provide the reader with some background information to provide a clearer understanding information Southern Paiute people have relayed in this report. This essay is designed to explain, but not in any way test, Indian testimony. What Indian people say about a place stands on its own, backed by the authority of the tribal governments who have reviewed and approved this report.

This chapter has four sections. We begin with a definition of Indian history, followed by an examination of the traditional sociopolitical units of the Southern Paiute Nation. We then provide a reconstruction of archival and ethnohistorical data regarding the Eastern Yanawant Southern Paiutes, and finish with an examination of changing federal Indian policy, as well as the current relations of certain Southern Paiutes to the GSE/NM. Each of these sections provides background or descriptive information discussed in subsequent chapters.

In the current study of the GSE/NM we relay knowledge shared by consultants of the Kaibab Southern Paiute tribe and supplement this with information gathered through archival research. Our analysis of the GSE/NM is unique from previously conducted research of this region in several respects. We seek to relay archaeological, historical, and ethnographic information in a way that is attentive and responsive to the paradigms of knowledge utilized by Southern Paiute consultants when conveying information about themselves, their ancestors, and their interconnectedness to the cultural landscape of GS/ENM. Part of this responsiveness entails a willingness to reevaluate what constitutes valid knowledge. Below we outline a number of components that consultations with some Kaibab Southern Paiute elders have led us to believe are essential in the development an Indian history.

What is An Indian History?

The official histories of the Indian people of this study area are rather easy to determine in broad outline and even in much of their detail. The central challenge of this chapter, however, is to produce histories reflecting the knowledge, experiences, and important processes of change undergone by the Paiutes. It is a recognized observation that each generation looks to the past and selects certain people, events, and process when interpreting their histories. In doing so, much of what happened in the past is ignored. When Indian people are given the opportunity to talk about their histories, they tend to emphasize very different issues that those expressed by official versions of US history. The following are six ways that Indian histories tend to differ from standard versions of the past:

- First, their histories begin when they were placed in these lands by the Creator and given the birthright responsibility to properly use and protect the animals, plants, places, and other elements.

- Second, their histories span over thousands of years during which time they selected places, events, and processes to commemorate.
- Third, when Europeans arrived, their animals and diseases spread before them (what has been termed "virgin soil epidemics" and "pre-arrival impacts"), permanently changing certain places and peoples, and radically altering aspects of the natural world.
- Fourth, the people of the United States tend to begin their histories with their arrival in the area. This occurs as early as 1776 with the travels of Spanish fathers – Escalante and Domingues. It continued with Anglo settlers, such as in July 1847 with the arrival of the Mormon people (at the Great Salt Lake) who were citizens of the US, but fleeing America into Mexican territory. With the end of the US war with Mexico and the signing of the Treaty of Guadalupe Hidalgo in 1848, the lands of this study became a part of US national territory. From an Indian perspective the lives of the Kaibab Paiute people were significantly impacted before then by more than 200 years of Spanish and Mexican warfare, trade, and political maneuvering with the Indian tribes of the Northern New Spain[4].
- Fifth, Indian people have selected their own heroes, critical events, and important processes of change. Indian heroes, including Posey in southern Utah and Queho in southern Nevada, were perceived as outlaws by the Americans. Other Indian leaders, like the Paiute prophet Wovoka whose vision stimulated the 1890 Ghost Dance[5] movement, were viewed fearfully by non-Indian society. Indian history tends to select people who act heroically by resisting the encroachment of outsiders. Similarly, historic events, like the 1869 treaty between the Navajos and the Mormons, were socially and biologically devastating to the Kaibab Paiutes, yet praised and commemorated by the Mormons whose villages were no longer under threat from Navajo raiders. Indian people view the process of environmental transformation very differently. They view, from a different cultural landscape perspective, the channelization[6] of streams during the last decade of the 19th century, the shifting of vegetative cover through overgrazing, removal of timber, and chaining of cedar trees to make grasslands, and the damming of rivers.
- Sixth, US historians and social scientists have discounted the presence of complex Indian social organization and large population sizes. According to Dan Bulletts, "White people killed lots of helpless Paiute people. Books leave all this out, leave out how they paid for Indian scalps in Salt Lake" (cited in Trimble 1993: 328). In an earlier interview, Dan Bulletts[7] conveyed a

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4 Note the photograph of a Southern Paiute slave who had been sold or traded and thus ended up a resident in the New Mexico community of Abiquiu, New Mexico in the book *The Valley of Shinning Stone: The Story of Abiquiu* by L. Poling-Kempes 1997. UofA Press.
5 See the recent article "Ghost Dancing the Grand Canyon: Southern Paiute Rock Art, Ceremony, and Cultural Landscapes". Current Anthropology 41:1:11-38, 2000. Also available on the web at: http://www.journals.uchicago.edu/CA/
6 See the *Historic Channel Change of Kanab Creek, Southern Utah and Northern Arizona* by Webb, Smith, and McCord 1991.
7 Personal interview with Richard Stoffle in 1972, see resulting article "Resource Competition and Population Change: a Kaibab Paiute Ethnohistorical Case" Ethnohistory 23(2), 1976.

> commonly held sentiment that there were once tens of thousands of Paiutes in this area before diseases killed them. Indian society naturally changed with the great losses of population, so post-holocaust descriptions do not accurately describe traditional Paiute society and politics.

The goal of this chapter is to describe interactions with the Indian people today and reveal those themes they wish to bring forward in their histories of the Grand Staircase-Escalante/NM area. In conjunction with this goal, we seek to provide information that takes into account Indian perspectives excluded from previous histories of this area. We begin the first section with an ethnohistory of the Numic speaking people. This analysis reveals the Southern Paiutes' deeply embedded attachments to the land of the Great Basin and western Colorado Plateau that date back thousands of years. The political organization of the Southern Paiute Nation during pre-contact times is presented, followed by an examination of the radical physical and sociopolitical destruction that resulted from the introduction of European diseases. Next, we provide a detailed ethnohistorical analysis of the sociopolitical structure of the Southern Paiutes in the twentieth century. Finally, we conclude with a broad spectrum ethnohistorical account of the radical changes evinced through the introduction of Spanish, Mexican, New Mexican, and Euroamerican populations, material culture, disease, and ideologies through the major trade routes linking such distant settlements as Mexico City, Santa Fe, Saint Louis, and Los Angeles.

Local History

The UofA team has worked on the history of the Kaibab Paiute district since the early 1970s. Since then a number of essays have been prepared, which address historic themes identified by elders as well as outlines of events and processes occurring in various portions of traditional territory. Research for these past essays generated large files of original data, which potentially will serve to enrich the local history that will be produced in this study. Interestingly, the current study area is among the most remote in the region, requiring original and innovative document searches in order to move beyond more general histories.

Fortunately there have been a number of eyewitness observations in this area. Beginning in 1776 with Fathers Escalante and Dominguez, there have been a number of detailed studies of how and where the Kaibab Paiute people lived. In the mid-1870s Powell and many of his fellow researchers, made deeper observations of fundamental aspects of Paiute culture. At the turn of the 20th century, Isabel Kelly and Omer Stewart collected ethnographic data from two very different but useful perspectives. Kelly's work was qualitative following her own research interests and the general guideline provided to young ethnographers at the time – study everything. Importantly, Kelly's field notes were published along with a detailed map of tribal boundaries and economic clusters for the eastern bands of Southern Paiutes. Stewart's work reflected the growing recognition that observations about human culture could only be made comparable if the same questions were asked everywhere of everybody. Following a trait list of more than 4,000 questions, Stewart interviewed all Southern Paiutes in the same way providing the ability to observe variances and patterns in Paiute culture. Taken together, Kelly and Stewart provide deep insights into Kaibab Paiute culture in the early 20th century. Similarly, insights can be derived from the linguistic work of Edward Sapir and the ethnobotanical work of C. Hart Merriam. A number of additional studies in the later half of the 20th century produced. These

studies were conducted with Kaibab Paiute people who came forward to share their knowledge of traditional territories in order to protect them from the many large-scale developments that were proposed following the construction of Glen Canyon Dam in 1969.

Paiute Views of Their Culture

Southern Paiute people have resided in their traditional lands for many generations. Southern Paiutes, Western Shoshone, Owens Valley Paiutes, Utes, and Goshutes are collectively called the Numic or Numa people — a term that refers to their language and common cultural traditions. According to some archaeologists, cultural anthropologists, and linguists who accept the "Numic Spread" theory (Bettinger and Baumhoff 1983), Paiute people came into the region by at least 1150 AD (Euler 1964; Shutler 1961). Other archaeologists (Torgler 1995; Whitley 1994a, 1994b), cultural anthropologists (Stoffle, Halmo, Evans, Olmsted 1990), and linguists (Shaul 1986) cite data that support the theory that the Numic peoples have continuously lived in the Great Basin and western Colorado Plateau for thousands of years. The Southern Paiute people perceive that the Creator placed them in this region, and that they have always been here.

The aboriginal boundaries of many Indian groups were established during the U.S. Claim Commission hearings (Sutton 1985). The U.S. Claims Commission established the aboriginal boundaries of the Southern Paiute ethnic group. They used various sources, which included travelers' observations in the late 1700s (Bolton 1950), Euroamerican settlers' diaries and official government surveys recorded in the mid-1800s (Little 1881; Powell and Ingalls 1874), and oral history interviews conducted in the 1930s (Kelly 1934, 1964, see Figure 7; Stewart 1942). In addition to the Claims Commission documents, recent ethnographic studies have further refined the aboriginal boundaries of the Southern Paiute (Bunte and Franklin 1987; ERT 1980, Halmo, Stoffle, and Evans 1993; Stoffle, Halmo, Evans, and Olmsted 1990; Stoffle, Austin, Halmo, Phillips 1997; see Figure 8).

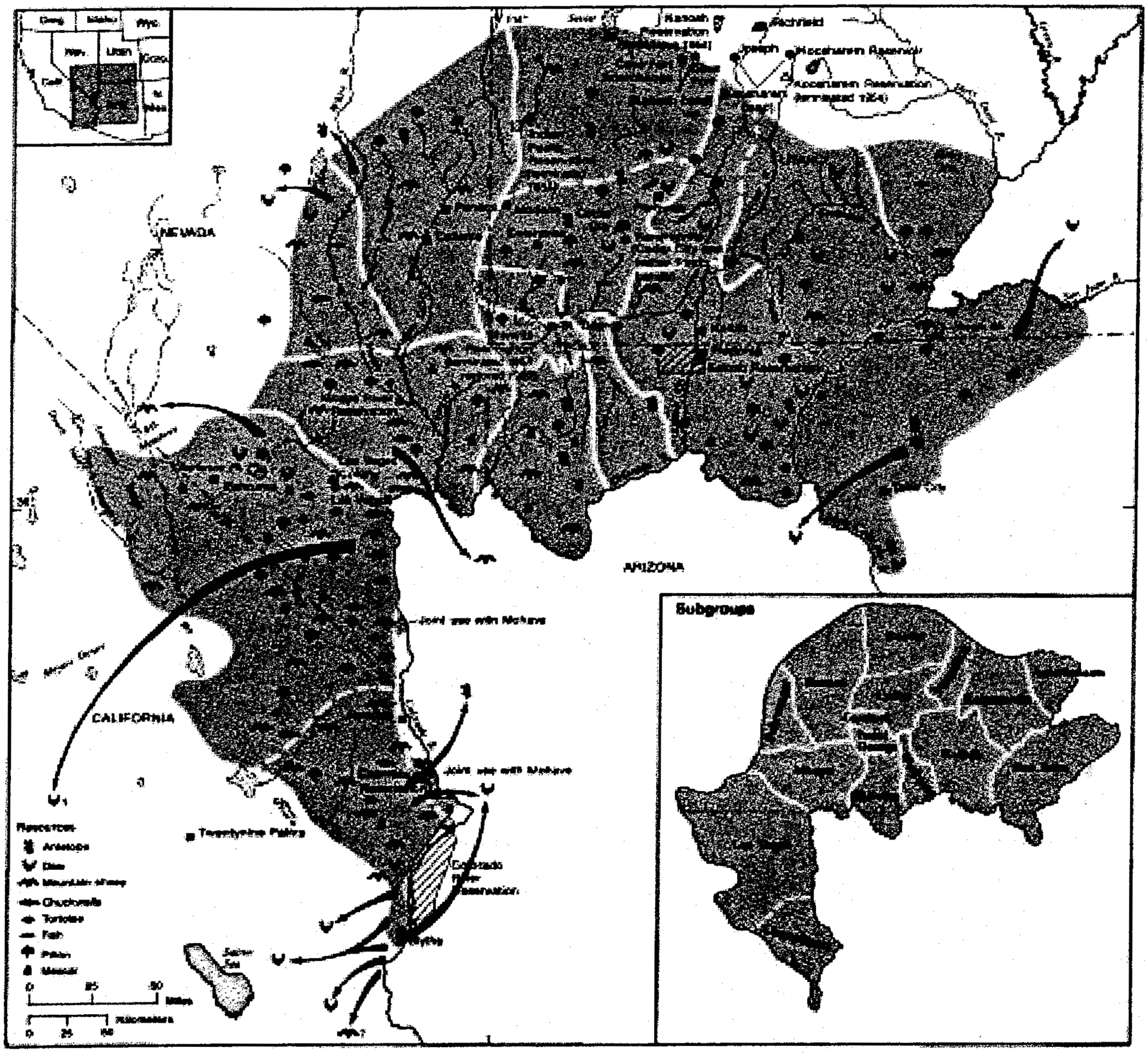

Figure 7. Kelly's map of Southern Paiute districts (revised; Kelly and Fowler 1986:369).

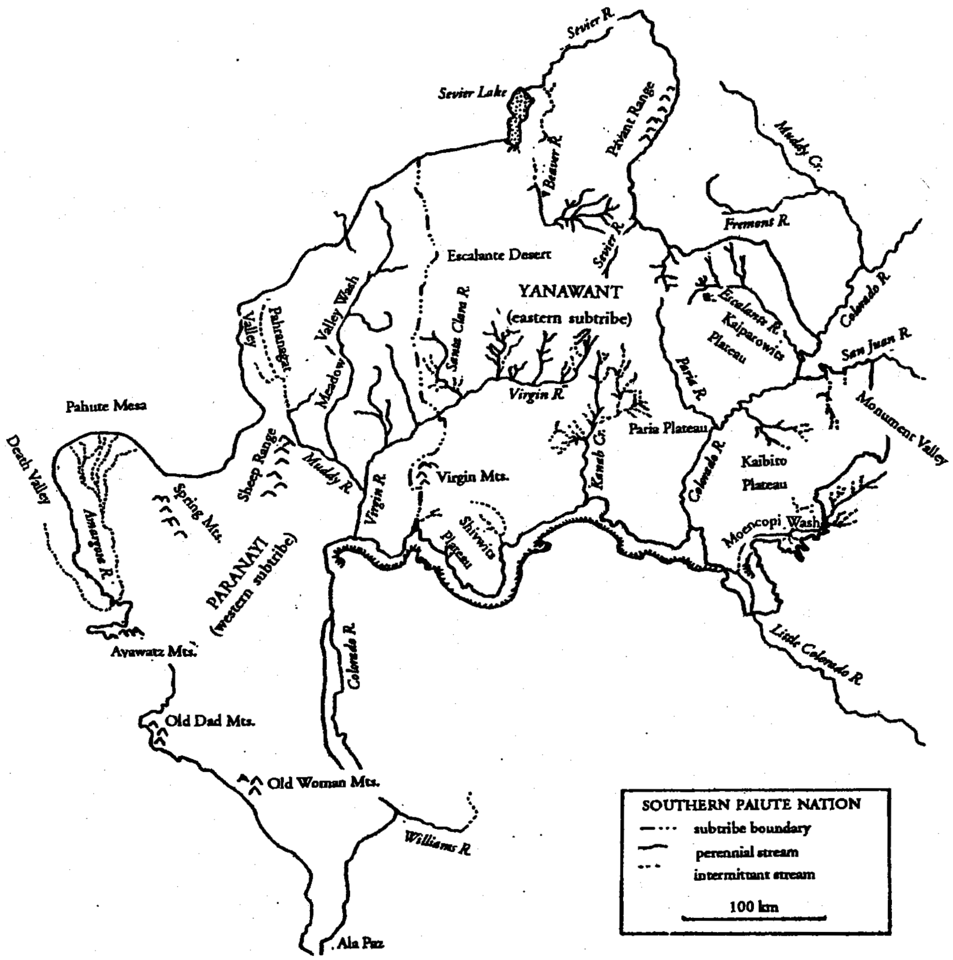

Figure 8. *Puaxant Tuvip*: The Southern Paiute Holy Land.

While Euroamerican scholars seeking to define boundaries and origin times for the Southern Paiutes examine forms of knowledge rooted in Euroamerican intellectual traditions, the Paiute people frequently look to religious knowledge to explain traditional ethnic territories and the events by which the people came to inhabit them. According to traditional Paiute beliefs, Paiute people were created in these traditional lands. Through this creation, the Creator gave Paiute people a special supernatural responsibility to protect and manage the land and its resources. In Euroamerican terminology, this land is their Holy Land (Spicer 1957:197, 213), and a portion of it is under the supervision of the Pahrump Paiutes (see Figure 8).

The Southern Paiute people believe that they were created by the supernatural near Charleston Peak — called *Nuva antu* [herein rendered as *Nuvagantu*] — located in the Spring Mountains (Kroeber 1970, Laird 1976, Stoffle and Dobyns 1983). According to Laird (1976:122):

> In prehuman times Nɨvagantɨ was the home of Wolf and his brother, Mythic Coyote. It was the very heart of Tɨwiinʸarɨvipɨ, the Storied Land.

There was and is no place in Southern Paiute traditional territory more sacred than the Spring Mountains and the areas around them. One author has noted that Charleston Peak is the most powerful of all cosmic centers in the southern and central Great Basin (Miller 1983:72). Concerns for this sacred area have been expressed repeatedly over the past 20 years in cultural resource studies involving Southern Paiute people (Stoffle and Dobyns 1982, 1983; Stoffle, Dobyns and Evans 1983; Stoffle, Evans, Harshbarger 1988).

Creation Stories

Southern Paiute oral scriptures that have been recorded generally resemble the Christian Genesis and other creation stories in terms of placing the people on the earth. While there are different versions of this story, the following account derives from southern California and was provided by a Chemehuevi Paiute (Laird 1976). According to this account, Southern Paiutes believe that originally there was only water. Ocean Woman (*Hutsipamamau ?u*) then created dry land (Laird 1976:148-149). Once there was land, Creator Coyote and Wolf lived on Charleston Peak. Creator Coyote later saw tracks of a woman, but when he caught up with her, she was a louse (*Poo?ʷavi*). Coyote propositioned her, and she agreed to the proposal on the condition that he built them a house. He ran ahead, built a house, and when Louse caught up, she magically put Coyote to sleep and continued on. This happened four times before they reached the Pacific Coast. Louse set out to swim to her home island with Coyote on her back. She dove, and Coyote let go and turned himself into a water spider. He reached the island first and was waiting for Louse when she arrived. Louse's mother wove a large basket while Coyote enjoyed Louse (Kroeber 1908:240; Laird 1976:150-151). Then Louse's mother sealed the basket and gave it to Coyote to tow back to land. As a water spider, he did so. As the basket grew heavy, Coyote became full of curiosity, and he opened it before reaching *Nuvagantu*. Louse's eggs had hatched in the basket and became human beings. The new human beings emerged from the now opened basket and began to scatter in all directions over the land. By the time Coyote returned to *Nu vagantu*, only weaklings, cripples, and excrement remained in the basket. On Charleston Peak, Wolf (Kroeber 1908:240 says it was Coyote) used his greater power to create the Chemehuevis

and their Southern Paiute kindred. The darker color of Southern Paiute skin is attributed to the ingredients used by Wolf to create them. Because it is the place where the Southern Paiute people were created, *Nuvagantu* — Charleston Peak — is holy to Southern Paiutes.

For each Southern Paiute tribal group, there is a slightly different version of this story (e.g., Lowie 1924, for Shivwits version; Sapir 1930, for Kaibab version) "which highlights the sacredness of their own local tribal territory" (Bunte and Franklin 1987:227). The Shivwits story has the emergence point at Buckskin Mountain in Kaibab territory (Lowie 1924:104). In general terms, however, Southern Paiute origin stories share much in common. In the San Juan Southern Paiute version of the Creation story, the cultural heroes (both Wolf and Coyote) are called *Shu nangwav*, a name that translates into English as "God" or the "Great Spirit" (Bunte and Franklin 1987:33). In this version, Coyote untied the sack [basket in other versions] near Page, Arizona, and it was there that the Southern Paiute people were made. This version also presents one creation place for all Paiutes in local territory of the San Juan Paiutes (Bunte and Franklin 1987:227). By moving the place of their ethnic group's origin, local Paiute groups strengthen their identification with the ethnic group itself and solidify their cosmological ties to that specific portion of Southern Paiute ethnic territory.

Despite local variations in the identification of the ethnic group's place of origin, all portions of traditional ethnic territory remain sacred to all Southern Paiute people. *Puaxantu Tu vip* (variant *Puaruvwip*) is the Southern Paiute term that translates into "sacred land" (Stoffle and Dobyns 1982). The Paiute term *pua* is cognate to the Shoshone term *puha*, or "power" (Franklin and Bunte 1993:3; Miller 1983). The term *puaxantu* is a derivative of the term *pua*; it may be transliterated as "powerful" or "(sacred) power." The indigenous Paiute term would refer to sacred or powerful lands, that is lands traditionally occupied by the ethnic group that are made powerful by being where the Creator placed the Paiute people.

The Federal government recognizes that all Southern Paiute people are directly associated with all portions of their aboriginal territory. This stipulation became the legal conclusion of the Federal government when, at the end of the Indian Claims Commission hearings, all Southern Paiute people received an equal financial compensation for the loss of aboriginal territory. Many local, state, and federal agencies have set the standard for government-to-government consultation by further recognizing what the Federal government and the Southern Paiute people recognize — that all Southern Paiute people have a sacred tie and contemporary right to be aware of and respond to actions that potentially impact traditional natural and cultural resources within the Southern Paiute Holy Land.

Traditional Southern Paiute Political Units

The Southern Paiute nation, before historic disruption, was comprised of several levels of political organization, including possibly two or more major subdivisions or sub-tribes, a dozen or more districts, and numerous local groups — sometimes referred to as bands — within each district. Some of the evidence of hierarchical organization comes from Laird's (1976) documentation of Chemehuevi institutions elicited from her Chemehuevi husband, George Laird.

Leaders occupied a special status with special symbols very visible in pre-contact Southern Paiute society. While male leaders have been referred to as High Chiefs, they functioned as ritualists rather than political officers (Laird 1976:24); at least, they did so in the late 1800s. Those who were called High Chiefs could wear turquoise. The elite spoke a special language known as "tɨvitsi?ampagapɨ" (Real Speech) in addition to the Southern Paiute language spoken by all Southern Paiutes. High Chiefs chanted it with a strong accent. Living members of the elite preserved that special language into the final decade of the 19th century. Quail-beans (*kakaramurih*), or black-eyed peas, became a special dietary item for the chiefly elite (Laird 1976:24). Leaders employed a specialized corps of runners to transmit communications. These runners were probably young men who were specially selected for this task (Laird 1976:47), and George Laird was one of the last runners (cf. Nabokov 1981).

Some Federal officials called Tutseguvits the head chief for a decade: from 1859 (Forney 1859:73) until 1869 (Fenton 1859:203). Another official in the early 1870s (Powell and Ingalls 1873) perceived that a single tribal chief named Tagon exercised some authority over all Southern Paiutes. That perception may well have been accurate, and a principal chief may have played a more important pre-contact role.

Leaders led at least regional polities made up of lineage bands (Laird 1976:24). In 1873, one identified High Chief who was active into post-conquest times, provided sacred leadership for lesser chiefs heading at least eight local lineage organizations based at Potosi, Paroom Spring, Kingston Mountain, Ivanpah, Providence Mountain, Ash Meadows, Amargosa, and the northern Chemehuevi (Fowler and Fowler 1971:104-105; Laird 1976:24). Leaders employed a specialized corps of runners to transmit communications. The elite appeared to have disappeared when the last surviving High Chief died late in the nineteenth century. In the 1870s, Powell and Ingalls perceived the functioning High Chiefs as heads of what they called confederacies of local groups (Fowler and Fowler 1971:109).

Disease and Sociopolitical Disruption

Diseases transmitted by Europeans probably first impacted the Southern Paiutes during the smallpox pandemic of 1520-1524, which spread from Mexico City throughout much of North America (Dobyns 1981, Campbell 1990). Throughout the 1500s, 1600s, and 1700s, major disease pandemic episodes spread from Mexico into the lands of the Pima, Hopi, Hualapai, and across the Colorado River to the Southern Paiutes. Like the Inca traders of South America, Southern Paiute traders were probably exposed to diseases while trading with neighboring Indian ethnic groups, after which they exposed people within their home settlements. Today we can only estimate the social, cultural and biological impacts that resulted through early centuries of exposure to Euroamerican diseases. However, book titles like *Their Number Become Thinned* (Dobyns 1983) and *American Indian Holocaust and Survival* (Thornton 1987) target the problems faced by Indian people during these times.

A historical record of more recent disease exposures as well as their social and cultural impacts exists in the accounts of literate travelers and immigrants. In these records, witnesses note changes amongst the Indian people as well as the presence of diseases within their own communities. The impacts of diseases brought by European immigrants in the early to mid-1800

are well documented in a recent analysis conducted by Stoffle, Jones, and Dobyns (1995). This analysis demonstrates that European immigrants that passed through and moved into Southern Paiute riverine oases transmitted diseases that resulted in the reduction of Indian populations. These declines were so rapid and widespread that most national and many subtribal functions were largely eliminated by the late 1850s (Stoffle, Jones, and Dobyns 1995). Ten diseases (measles, cholera, malaria, tuberculosis, scarlet fever, whooping cough, typhoid fever, intestinal parasites, mumps, and smallpox) assaulted Southern Paiute peoples from 1847 until 1856. These ten diseases accounted for the deaths of thousands of Southern Paiutes. During the years 1857-1876, the rate of direct European transmission of Old World diseases began to slow appreciably, however this reduced impact largely resulted from the fact that not as many Paiutes were living after 1857 (Stoffle, Jones, and Dobyns 1995:194).

Even with fewer numbers, the Southern Paiute population continued to drop throughout the latter part of the 19th Century and early 20th Century. A newspaper report from southern Nevada in 1905 confirms this decline. According to the census taker, Mr. Harsha White, "the Piute (sic) population has decreased 60 per cent since 1890" (Stoffle, Olmsted, and Evans 1990: 113-114). One consequence of this radical population decline was even the basic socio-political units that once reflected dense aboriginal populations could no longer be maintained.

The arrival of European diseases stands out as one of the most important factors in inciting sociopolitical change among the Southern Paiutes. These destructive events probably began when the first pandemics spread north from Mexico City in the 1500s, however we have little evidence on the exact social and cultural impacts of this period. In contrast, the presence of diseases, as well as their impact upon Indian communities, is well documented for more recent times. During the Spanish occupation of northern New Spain we find a rather complete record of diseases and their impacts among the neighbors of Southern Paiutes. In the south we find clear evidence for the lower Colorado River tribes in the 1700s. To the east we find a good record of events for the Pueblos, especially the Hopi, who were the immediate trading partners of the Paiutes.

The best-known disease episodes that may have spread to the Southern Paiutes between 1520 and 1837 are presented in Table 2.1. Most of these episodes have been documented as a result of the regular Spanish contact with various Pueblo peoples after 1625. One well-documented event occurred between 1777 and 1780. The rains in northern Arizona had failed for 3 years, and the Hopi were low on crops, water, and pastures for their herds. According to John (1975:593), disease bred in the scant, stagnant water deposits, and the Hopi people, weakened by hunger, had little resistance to sickness. In the spring of 1780, the Spanish governor Anza marched a troop of solders to the Hopi to convince them to submit to Spanish policy. According to John (1975:596), the smallpox epidemic that was now ravaging the Pueblos in New Mexico had hit the Hopi as well. Less than 5 years after Father Escalante had calculated the Hopi population at 7,494, all but 798 had died (John 1975:600). Anza reported that some Hopi moved to the Colorado River to live with the Havasupai and others set out for New Mexico on their own. Nonetheless, many were dead. Two of the seven Hopi villages had been totally abandoned, and none had more than 45 members in them. Still, the best evidence of disease episodes influencing the Southern Paiutes comes during the 1840s when wagon train after wagon train arrived in the region from the eastern U.S.

Table 2.1: Major Epidemic Episodes of Old World Diseases Among Pueblo Peoples That May Have Spread to Southern Paiutes Trading at Oraibi[8]	
Date	**Disease**
1837	Typhoid fever and smallpox
1826	Measles
1816	Smallpox
1799-1800	Smallpox, apparently pandemic
1780-1781	Small pox, clearly pandemic
1759	Smallpox
1748	Smallpox
1738	Smallpox, apparently pandemic
1728-1729	Measles
1719	Smallpox
1695-1699	Fever, smallpox
1671	Pestilence
1635	Measles
1613-1617	Bubonic Plague
1592	Measles
1564	Smallpox
1545-1548	Bubonic and pneumonic plague, evidently pandemic
1531-1533	Measles, possibly chickenpox, scarlet fever, or a combination
1520-1524	Smallpox, pandemic in hemisphere

1840-1875 Depopulation

Depopulation from diseases transmitted by European immigrants who passed through and moved into Southern Paiute riverine oases caused many national and many subtribal social, political, and cultural functions to be largely eliminated by the late 1850s (Stoffle, Jones, and Dobyns 1995). Ten diseases (measles, cholera, malaria, tuberculosis, scarlet fever, whooping cough, typhoid fever, intestinal parasites, mumps, and smallpox) assaulted Southern Paiute peoples from 1847 until 1856. These ten diseases accounted for the deaths of thousands of Southern Paiutes, and the depopulation continued throughout the 19th century.

Table 2.2 presents both a summary of known diseases and a model for better understanding their impacts on the Southern Paiute people. The table assumes a hypothetical Southern Paiute population of 1,000 individuals in 1845 and assesses the impacts of various epidemic and endemic diseases over the next 11 years. The figures used in the model are to illustrate hypothetical impacts. All the figures would be proportionally larger if the actual population of Southern Paiutes in 1845 were 10,000 people. Similarly, the impacts of each episode or ongoing impacts of endemic diseases are estimates based on comparable events

[8] Detailed citations are available for each disease episode in Stoffle, Jones, Dobyns 1995:196.

elsewhere. While the actual number can be argued, the evidence suggests drastic population decline during just this critical decade. And, as the next section will demonstrate, disease impacts were to continue well into the 20th century.

Table 2.2: Epidemic Disease Mortality Model of Numic-Speaking Native American Population Change, 1847-1856 (estimated)[9]

Date	Disease	Rate	Loss	Population
1845				1,000
1849	Measles	25%	250	750
1849	Cholera	15%	113	637
1849	Malaria	15%	64	573
1850	Tuberculosis	5%	29	544
1851	Malaria	3%	16	528
1851	Tuberculosis	3%	16	512
1852	Malaria	3%	15	497
1852	Tuberculosis	3%	15	482
1853	Scarlet fever	20%	96	386
1853	Whooping cough	15%	58	328
1853	Malaria	3%	10	318
1853	Tuberculosis	3%	10	308
1854	Typhoid and/or parasites	10%	31	277
1854-55	Mumps	50%	138	139
1855	Malaria	2%	3	136
1855	Tuberculosis	2%	3	133
1856	Malaria	2%	3	130
1856	Tuberculosis	2%	3	127

1875-1900 Depopulation

A 1905 newspaper in southern Nevada carried a story about Mr. Harsha White, who took the 1900 U.S. Census. White is quoted as saying that "the Piute (sic) population has decreased 60 percent since 1890" (Stoffle, Olmsted, and Evans 1990:113-114). White was the son-in-law of Joseph Yount who settled at what was called Manse Springs in Pahrump Valley in 1876 (McCracken 1991:12). Brooks quoted Yount (1970:11-12) during an 1886 interview as having said to his new wife when she arrived and asked, "Where are we?"

> We are in Palorump [sic, Pahrump] Valley, Nye County, Nevada, and Mr. Bennett, six miles distance, is our only neighbor, except that we consider the hundreds of roving Paiutes neighbors...

White graduated from the University of Missouri in 1870, traveled west with the Yount family as a teacher, and married Maude Yount in 1872. Like his father-in-law, White knew and interacted frequently with the local Paiute people. Both White and Yount are pictured with Chief

[9] See Stoffle, Jones, and Dobyns 1995:192 for full citations and discussion of the model.

Tecopa around 1900, suggesting they had a special relationship with the Paiute leader and the local Indian community (McCracken 1991:5). As a college-educated man with first-hand local experience, White spoke with authority about Paiute population declines between 1890 and 1900. White was in a position to have directly observed the deaths of many Southern Paiute people, especially those in the Pahrump region.

The High Chiefs

It appears that a small subset of the elite Paiutes provided all of the Southern Paiute people with socio-religious, economic, and political leadership. Evidence suggests that the Paiute people selected a principal chief or High Chief to govern the nation by sitting in a leadership capacity over local chiefs. There appears to have also been regional chiefs that were not considered the High Chief. The position of High Chief appears to have played important political, economic, and cultural roles before European contact, which is generally considered to be after the 1770s during the Spanish period. The basic concept of the position High Chief continued until the middle of the Twentieth century.

After the Treaty of Guadalupe Hildago in 1848, Southern Paiute territory became a part of the United States, and we begin to find official references to the High Chiefs. Beginning in the 1850s, the elite male leadership of the Southern Paiutes were referred to as High Chiefs by a variety of Euroamericans. The presence of Southern Paiute leaders were recorded by Mormon settlers such as Jacob Hamblin in 1854 and Andrew Jensen in 1855; federal government surveyors such as Wheeler in 1869 and J. Powell and G. W. Ingalls in 1872; regional historians such as William R. Palmer in the 1880s; and ethnographers such as Julian Steward in the 1920s.

Some U.S. Federal and Mormon Church officials called *Tutseguvits*, who lived on the Santa Clara River in southern Utah, the Head Chief of the Paiute people. He was called Head Chief for a decade, from 1859 (Forney 1859:73) until 1869 (Fenton 1859:203). In 1869, Wheeler (1875) named *Tercherum* as the "Principal Chief" of the area. Another U.S. official in the early 1870s (Powell and Ingalls 1874) perceived that a single tribal chief named *Tagon* exercised some authority over all Southern Paiutes.

Chiefs of Alliance

In the early 1870s Southern Paiute enumeration, Powell and Ingalls also perceived the functioning of High Chiefs as heads of what they called confederacies of local groups (Fowler and Fowler 1971:108). They identified a dozen Chiefs of Alliance and created a special column in the report indicating their role over other leaders who were called just "Chiefs" (Fowler and Fowler 1971:105). One of these dozen Chiefs of Alliance was named *To-ko-pur*. He provided leadership for local chiefs who headed at least seven local lineage bands which were based in the (1) vicinity of Potosi, (2) Pa-room Spring, (3) Kingston Mountain, (4) Ivanpah, (5) Providence Mountain, (6) Ash Meadows, and (7) Amargosa (Fowler and Fowler 1971:104-105; Laird 1976:24).

These seven local lineage bands roughly correspond to the boundary of what is called the Pahrump Paiute district (see discussion later in this chapter). It is also interesting to note that

Powell and Ingalls recorded the presence of other Chiefs of Alliances heading combinations of local lineage bands whose territory added up to a Southern Paiute district. In another case, when we add up the territory of the local lineages under *Tau'-gu* in northern Arizona and southern Utah, the area totals most of the area of the *Yanawant* subtribe.

In parallel fashion, neighboring Shoshone groups in southern Nevada were recorded to have had a position of Alliance Chief (and perhaps High Chief). The main camp of one Alliance Chief was called *Waungiakuda*, which is a place at the foot of Pahute Mesa where Indian people continued to live until the 20th century. Then, for unknown reasons, the family members dispersed. In the late 19th century, the site was occupied on a full-time basis and served as a place where people from the region wanted to visit for various reasons. It was the home (perhaps one of the homes) of *Wangagwana*, who was known as the "chief of this general region" in the 1930s, years after his death (Steward 1938:95). The village site was the birth place and early residence of *Wangagwana's* son who the non-Indians called Panamint Joe and who the Indian people considered as "Chief of the Shoshone" during the rhyolite mining boom about 1906 (Steward 1938:95). *Waungiakuda* was a place to visit for hunting, gathering, trade, and ceremony in the late 19th century.

Steward noted the presence of many local chiefs (Steward 1938) based on his interviews in the 1930s, and Laird independently conducted interviews that recorded the presence of local chiefs who led a number of local groups made up of lineage bands (Laird 1976:24). There are strong databased arguments for the existence of a traditional system of local, regional, and national chiefs among the Southern Paiutes. This traditional political leadership system was stressed and eventually declined in frequency and function due to invasions by Euroamericans, their animals, and their diseases. Eventually, scholars and laypersons alike were to characterize Southern Paiute people as lacking political organization above the family level.

Twentieth Century High Chiefs

The deaths of many Southern Paiute people meant that traditional sociopolitical units previously reflective of the needs of dense aboriginal populations could no longer be maintained. However, despite the loss of people and the lessened need for national-level systems of political, economic, and social power, some aspects of national and subtribal leadership persisted.

Chief Tecopa

In the early 1930s, Julian Steward (1938:185) recorded that a chief from the region of Pahrump and Ash Meadows, named Takopa [sic, Tecopa] was a leader of "all the Southern Paiutes." The Indian people who Steward (1938:185) interviewed in the 1930s stated that,

> The Paiute of the Pahrump and Las Vegas regions were never unified in a single band. A.H. names a succession of three Las Vegas chiefs (towin'dum): Patsadum, who died many years ago; then Tasidu'dum, who also died many years ago; then A:udia', who was recently killed. For the region of Ash Meadows and Pahrump he named Takopa (who was probably born at Las Vegas and died at Pahrump about 1895 [actually 1905]). Takopa's main function was to direct the festival.

> Ch.B. added that when Mojave raided Las Vegas people, Takopa might assist them, perhaps even taking command.

It is interesting that the people Steward interviewed could list the names of three Las Vegas area chiefs, but only listed Tecopa as the chief of the Pahrump region. Perhaps this reflects the fact that Tecopa had been the Chief of the Pahrump Paiute region from early 1870s until 1905, or approximately two generations.

Continuities in Southern Paiute Political Leadership

Chief Penance

After his death in 1904, another southern Nevada leader replaced Tecopa. Steward suggests the new High Chief was named Benjamin and was a veteran scout of the U.S. Army who had lived at Tule Springs near Las Vegas (Steward 1938:185). Local newspapers, however, named Jack Penance as the new High Chief.

The center of national authority shifted from Pahrump to Las Vegas with the selection of Jack Penance as High Chief. This was the first time the High Chief had not lived with the Pahrump Paiutes since at least 1874. This shift also means that the Pahrump Paiute district began to be lead by a district chief rather than a regional or national chief.

Chief Skinner

When Chief Penance died in 1933, Chief Harry Skinner replaced him. The newspaper account covering this important political event was entitled "Piutes (sic) Install New Chieftain at Tribe Ceremonial." This newspaper article documents the continuation of Paiute national-level leadership well into the second half of the 20th century. The Tonopah Daily Times- Bonanza (10/04/33:4,1) recorded the inauguration of the Southern Paiute chief as follows:

> With a mournful chant pouring from 300 aboriginal throats...the Southern Nevada Piute (sic) tribe, including Indians of Southern Utah, Southern Nevada and Northwestern Arizona, installed a new chief recently. Their old chief, Jack Penance...was killed recently in a very 20th century automobile, loaded with blankets, his squaw and about eight children (when it) blew a tire and overturned. One of his friends, known to white men as Baboon[10], served as head of the Nevada Indians a short time until a pow-wow could be set and distant Piutes (sic) called into meeting. Over desert roads they came, many by foot, horseback and wagon, but the number who maneuvered themselves and families to the reservation in rattling, brass-bound flivvers was amazing to old time desert dwellers...Harry Skinner, a young government Re-educated Piute (sic) from Arizona, was named Chief...

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[10] "Baboon" was the nickname of Jack Laug who was Daisy Mike's mother's brother. Mrs. Mike was a Las Vegas Paiute elder who was taped during a tribal history interview in 1974 by Jackie Rice and Floyd O'Neil (Rice and O'Neil 1974: Mike tape transcript, p.24).

Because Harry Skinner was from northern AZ, it is possible that this election shifted the center of national leadership to the northern portions of the Southern Paiute Nation. The election of a new national Chief in 1933 clearly documents that the traditional position of High Chief continued to have some functions and value to all Southern Paiute people. This event illustrates that Southern Paiute people and traditional society persisted into the 20th century, as they struggled to maintain social and political structures when possible and always maintained their deep personal attachments to their supernaturally given ecosystems that continued to sustain Paiute people.

Subtribes

Just below the level of the Southern Paiute nation as a whole, there may have been two or more large divisions, with each encompassing a number of neighboring districts. The divisions would have included geographically contiguous districts having particularly close ties of economic exchange, intermarriage, and political cooperation. Though the evidence for these intermediate-scale political divisions within the Southern Paiute nation is sketchy, past research suggests that prior to about 1825 there may have been two divisions. The first division was a western subtribe called *paran'|□itsi□*ʷ (Sapir 1910:3, herein rendered as *Paranayi*)] and the second division was an eastern subtribe that derives from a native designation that Jacob Hamblin recorded as *Yanawant* (Stoffle and Dobyns 1983a, 1983b; Stoffle et al. 1991:7-8; Brooks 1950:27; Little 1881).

The relation between ecosystems and socio-political units becomes evident in both the structure and naming of these sub-tribes. The key contributions that riverine oases made to Southern Paiute subsistence made certain major streams geographically central to aboriginal life. It is important to note, however, that socio-political units do not always exactly fit the natural boundaries of ecosystems.

Paranayi Subtribe. The term *Paranayi* loosely translates into "marshy spring people" (Hodge 1910:202) or "people with a foot in the water" (Palmer 1928:11; Kelly 1934:554) and refers specifically to the Paiute people who lived in the Pahranagat Valley-Meadow Valley-Moapa Valley riverine oasis. Although some scholars have used this name in reference to the Pahranagat Valley Paiutes, it is evident that the aboriginal use of the term was much broader.

The water referred to in this designation flows down the Pahranagat Valley, Meadow Valley Wash, and later joins with the Muddy River. This, in turn, joins with the Virgin River, and then flows into the Colorado River. From the Colorado River back upstream to the headwaters of Pahranagat Valley and Meadow Valley ran the ribbon-like oasis where people cultivated food crops.

The Muddy River appears to have been the headquarters of this subtribe. The western division of the Southern Paiute nation seems to have been too populous and too wide ranging to be properly labeled a district. Therefore, *Paranayi* might properly be considered one of two subtribes constituting the Southern Paiute nation, where the term "subtribe" is used in a purely technical sense to indicate that the tribe formerly consisted of western and eastern components.

Previous studies (Stoffle and Dobyns 1983a, 1983b) suggest that, when Euroamerican colonization of southern Nevada began, the entire western and southern portion of the Southern Paiute nation was known as *Paranayi*. Within this great geographical area were a number of districts (a concept discussed more later) including the Moapa/Paranagat, Las Vegas, Pahrump/Ash Meadows, and Chemehuevi districts.

Yanawant Subtribe. Southern Paiutes inhabiting the higher altitude plateaus of southern Utah and northern Arizona planted their summer crops primarily in the Santa Clara River oasis, up the Virgin River from that tributary, and all along Kanab Creek. Paiute farmers grew maize and other crops on sand bar fields along the Colorado River. The San Juan Southern Paiute people may have stayed south of the larger stream, planting in oases along the San Juan River and its tributaries, at Paiute Canyon, and the springs and wash floodplains along the Echo Cliffs to the Moenkopi area near Tuba City (Bunte and Franklin 1987:30). The eastern subtribe may have been self-labeled *Yanawant* (Brooks 1950:27).

In the 1850s the Santa Clara Paiute people used a term for themselves that English speakers recorded as *Yanawant* with several variant spellings. For example, Jacob Hamblin used the term *Yanawant* for the Indian people of the region. He attributed this usage to the Indian people themselves, including their overall Chief Tutsigavits. Hamblin quoted the chief as saying "I want all the Yamnawants to love the Mormons all the time" (Corbett 1952:84). In his mid-1850s narratives, Hamblin often referred to the Yanawants. For example, "the Yannewants were much alarmed" (Hamblin 1951:18); "a good feeling prevailed among the Yanwants as they call themselves" (Little 1969:39); and "I started for Great Salt Lake City in company with Thales Haskell and Tut-se-gavit (the Yamnawant Chief)" (Corbett 1952:114; Hamblin 1951:27).

In 1872, John Wesley Powell recorded the term *U'-ai-nu-ints*, which Powell defined as "People who live by farming" and also glossed as "Santa Clara Indians" (Fowler and Fowler 1971a:156). This may be the same term as Hamblin's *Yanawant*. In another report by Powell, *U-ai-Nu-ints* are identified as the people "who live in the vicinity of St. George" (Powell and Ingalls 1874:47,51). In another manuscript, Powell renders the same word as "*U-en-u-wunts*, the name of the Santa Clara Indians" (Fowler and Fowler 1971b: 161). Elsewhere Powell renders the term as *Yen-u-unts*, meaning "Farmers, those who cultivate the soil" and also as *Yum-a-wints* and *Y-ai-nu-intz*, "People who cultivate soil; farmers" (Fowler and Fowler 1971a: 144).

William Palmer, based on late 1880s interviews, used the term *U-an-no* or *U-un-o* as referring to the St. George area, and also to the larger region of "Dixie"; he recorded that the meaning of *U-un-o* was "good garden place or good fields" (Palmer 1928a: 24). Palmer also rendered the word as *Uaino* and *Uano* (Palmer 1928b: 50). Adding the suffix *its* or *ints*, to refer to the people of a place (1928b: 40), Palmer gave the variant spellings of *Uain-uints, Uano-ints, Uano-its* (Palmer 1928b: 50), and again *U-an-nu-ince* and *U-ano-intz* (Palmer 1933:95) as the term used for people who farm and for aboriginal people of the Santa Clara River. In one article Palmer noted that these numerous variants of *U-an-nu-ince* refered to the economic activity of farming rather than to a specific group of people:

The word "u-an-o" means farmers. The Indians who lived at Washington, St. George and Santa Clara were farmers and they knew something of the practice of irrigation. They cultivated

corn, beans and sunflowers for their seed, and other plants used for food and for fibre. For this reason the comparatively small area of Utah's Dixie in which farming was done was called "U-an-o," and the farmers were "U-an-nu-ince" or "U-ano-its." The name has no clan or tribal significance. Instead it signifies the vocation assumed by many of these people (Palmer 1933:95).

The Indian words that Euroamericans have adopted to label geographically localized groups of Indian people traditionally did not have such localized points of reference. It is certain that *Yanawant* referred to the people of the Santa Clara River, since they cultivated crops, but it is probable that Euroamerican usage gave the term a more localized reference than the term originally had. When the broader meaning of *Yanawant*, that is, "people who farm," is considered and when this is tied to the regional leader who defines himself as the head of the *Yanawant*, a more likely meaning is a reference to all the people within this territory who farm.

Since all Southern Paiutes farmed, it is likely that Yanawant served as a term to discriminate between Southern Paiutes and their close neighbors whether they were Utes or Shoshone who did not farm. Therefore, the term Yanawant was one of inclusion as well as exclusion. All Southern Paiutes under the socio-political control of the subtribe leader were included, whereas other Indian people who did not farm were excluded. Similar observations appear to have been true for the term *Paranayi*. Given the likelihood that such terms referred to socially complex socio-political groupings, one might think of the *Paranayi* subtribe as referring to the organization of the Nevada-California Southern Paiutes, and the *Yanawant* subtribe as the organization of Utah-Arizona Southern Paiutes.

Districts

Traditionally there were about a dozen smaller regional units referred to as *districts*, a term adapted from Julian Steward's *Basin-Political Aboriginal Sociopolitical Groups* (Steward 1938:93) and used by Kelly (1934:560). Each district was a sphere of influence with a geographic territory shaped in part by natural features--chiefly watercourses and watersheds--and in part by the existence of neighboring groups who, of necessity, reached political agreements about the extent of their respective spheres of influence and resource harvesting territories.

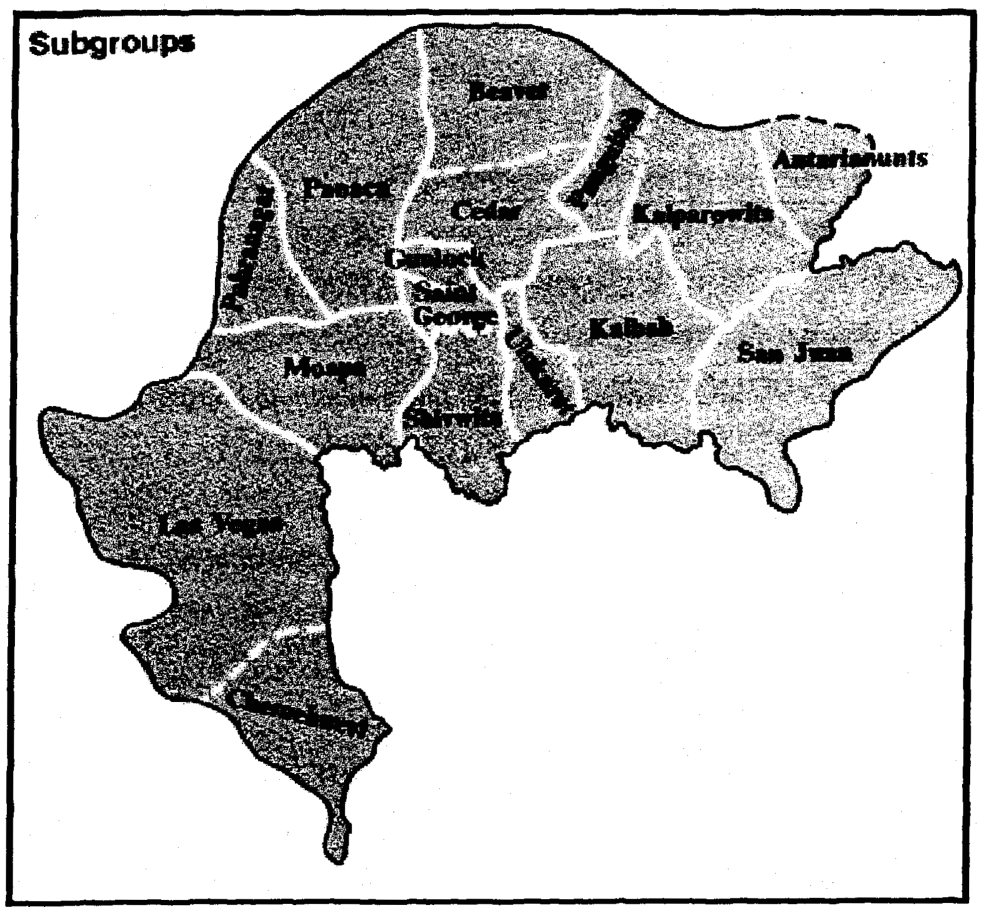
Each Southern Paiute district encompassed a territory that contained all, or nearly all, of the resources necessary for the survival of its population. Each district needed to include, and did include, both (1) oasis areas with either riverine or spring-fed sources of water sufficient for irrigation farming, and (2) upland forests and lowland desert areas with a full range of needed wild resources, including game animals, pinyon nuts, and wild seed grains. Each district, then, included permanent settlements near irrigated fields in oasis areas, and outlying upland and lowland territories used for intermittent and seasonal harvesting of wild plant and animal resources from temporary camps. Often small permanent habitations were maintained in the uplands or lowlands near springs. These hinterland settlements were established in order to safeguard Southern Paiutes' claims to those areas as well as the crucial resources they contained.

Kelly's Ethnographic Perspective on Districts

The first scientific analysis of Southern Paiute districts was conducted by Kelly (1934) based on her 1932-33 field interviews. Kelly produced and published a map (Figure 5) that has been used for more than fifty years to define aboriginal Southern Paiute district territory (Kelly 1934). Recently updated and reprinted with the help of Fowler (Kelly and Fowler 1986:369), the Kelly/Fowler map continues to use the 1934-district boundaries while also including a new district called the *Antarianunts.*

Kelly's district boundaries must be considered in light of more recent research, and in light of the internal inconsistencies between her published map and her own descriptive text (Halmo, Stoffle, and Evans 1993). Any errors or omissions in district boundaries would be of little more than scientific interest were it not that federal agencies (including the National Park Service) assume for purposes of official government-to-government consultation that the aboriginal boundaries as depicted by the Kelly/Fowler maps are accurate, and thus reflective of the aboriginal socio-political units and contemporary tribal governments.

Figure 5: Kelly's map



It was in the core oasis area (or areas) of the district that the population of a district had the most highly developed sense of territoriality and proprietorship. Core oasis areas and central places of the districts are readily identified. Outer boundaries of districts cannot be as precisely delineated, for at least two reasons. First, those areas were not as sharply delineated by Native American people, as were the core oasis areas where the most valuable resources were concentrated. Secondly and not surprisingly, there is much more written documentation of the central oasis areas where Euroamerican settlement was concentrated than for outlying upland and desert areas.

Each district had its own political leadership. In the case of the Shivwits/Santa Clara Southern Paiutes, this included a principal leader (principal chief or head chief) for the entire district, and lesser leaders (or subchiefs) from the various local groups or bands comprising the district. There was apparently a similar pattern of leadership in the other districts as well.

Ecosystem Analysis of Yanawant Districts

This portion of the essay is focussed on the *Yanawant Subtribe* of the Southern Paiute Nation within the context of contemporary understandings about ecosystems and their relationships with aboriginal socio-political structures. In this analysis it is necessary to briefly discuss the people of several districts. This examination includes the Shivwits/Santa Clara district people who were located in the Virgin River ecosystem, the Kaibab district people who were located in the Kanab Creek ecosystem, and the San Juan district people who were located on the east side of the Colorado River. The people of the San Juan district formed the Southern Paiute border with the Hopi territory and Navajo territory. In addition, an exploration of an ecosystem hypothesis is presented. This hypothesis leads to the possibility that the Uinkaret people were actually connected with another local group living on the Virgin River and together they formed a "missing" Paiute district call the *Ua'ayukunants* (also spelled in the literature as *I-oo-goonits*) perhaps more correctly spelled *Ua'ayukunants* district.

Social and Ecological Logic of Districts

Anthropologist A. L. Kroeber generalized from his study of the Mojave Indians who inhabited Mojave Valley and Cottonwood Island Valley, which are the first large valleys on the lower Colorado River with cultivable floodplains south of the Virgin-Colorado confluence. Through his analysis he concluded that an Indian tribe inhabiting a river valley typically exploits upland resources on both sides of the stream (Kroeber 1974:31-33). The data suggest that this economic and ecological model can be transferred upstream to the Southern Paiutes.

Julian Steward, one of the founders of culture ecological theory in anthropology, observed that Western Shoshones and Southern Paiute people had socio-political organizations larger than the local group. At the time, however, Steward was developing an ecological theory of social evolution that was founded on the assumption that some people who reside in extremely harsh environments, like that of the Great Basin, had social organizations no more complex than families. Although this theory has largely been disputed, its development probably prevented Steward from refining a more complex model of social-environmental interactions in the Great Basin.

Steward's more authoritative essay on the concept of the district reflects a confusion among ethnographers in the 1930s. These ethnographers attempted to resolve observations made by earlier Indian observers. The observers included people like the non-anthropologically trained J. W. Powell and G. W. Ingalls from the 1870s as well as the lay observer William R. Palmer (1933); a President of the Parowan Stake of the Mormons, who conducted interviews during the 1880s. Steward questioned Kelly's (1934) 15 Southern Paiute districts and contrasted them with Powell and Ingalls' (1874) 31 Southern Paiute groups. Steward concluded that the 31 units were more likely inasmuch as "band members must habitually have cooperated in a sufficient number of economic and social activities under a central control to have acquired a sense of community of interest" (Steward 1938: 181). This conclusion derives from Steward's assumption that there were very few Southern Paiutes - less that 1 Paiute for every 28.5 square miles between 1870 and 1880 - thus, one of the lowest population densities within the Great Basin (Steward 1938: 47). When there are so few people per square mile, "It is difficult to understand how people who were scattered over such vast territories and often separated by wide, waterless deserts could, when traveling on foot, habitually have joined forces in any important communal undertaking" (Steward 1938: 181). Here we have a critical point. This is where Steward was incorrect because he based his conclusion on incomplete data. He incorrectly assumed (1) that the land was arid, when in fact the environment of the Southern Paiutes contained extensive riverine oases, and (2) that the 1870 Southern Paiute population reflected an aboriginal condition, when in fact the population had drastically declined by 1857.

People who wanted to reconstruct Southern Paiute social organization did so with theories that made sense at the time they wrote and with whatever data was available. Today, however, we can continue to consider these issues in light of new population and document evidence. Today, it seems that there was a social-ecological logic to the aboriginal structure of Southern Paiute districts. Each district needed a *core area* in a riverine oasis or major artesian spring system where there were permanent farms and villages. In most cases, core area farming involved extensive systems of irrigation. Functionally offsetting the agricultural core of a district were its *hinterlands*. The hinterland gave the district the ecological diversity needed for the *transhumant adaptive strategy* (Stoffle and Evans 1976) component of the overall strategy of ecosystem utilization. Hinterlands existed at different elevations than the oasis core. Higher elevations produced a diverse assortment of animals like deer and mountain sheep, while lower hinterland elevations provided chuckwalla and antelope. Plants were an especially important component of the hinterland because not only do higher and lower elevations produce different types of plants, the same plants growing at different elevations can be harvested at different times of the year. Hinterlands provided a variety of natural resources like salt, paint, and tool-making quarries. Often power spots, caves, and various types of ceremonial areas tended to be located in the hinterland and away from the core area.

When the Southern Paiute district is viewed as an ecological whole, there is a social-ecological logic behind the selection of core areas and hinterlands. When this logic is applied to the Yanawant subtribe, it and its components begin to make sense in new ways. When this logic is applied to Kelly's 15 districts some make sense, others need recombining, and at least one seems to be missing.

Shivwits/Santa Clara District

Kroeber's model suggests that Southern Paiutes who farmed in the riverine core along the Santa Clara River (called *Tonaquint* in Paiute) and middle Virgin River, would have harvested wild resources in hinterlands to the south (including the Shivwits Plateau), as well as to the north (including the watersheds feeding the tributaries of the upper Santa Clara River). Thus combining the Shivwits and Santa Clara districts seems essential.

Other data suggests that three of the groups defined by Kelly and Fowler (the Gunlock group, the St. George group, and the Shivwits group) in fact comprised a single group or district. In the decades after contact, the massive impact of Mormon colonization resulted in the gradual breakdown of regional political organization, the emergence of labor camps associated with Euroamerican towns (Gunlock, St. George), and the relocation of much of the population into regions of refuge in the uplands (Shivwits Plateau).

The geographic boundaries of this new Shivwits/Santa Clara district would have been the Santa Clara River, the upper Santa Clara watershed to the divide with the Colorado Plateau and the Great Basin, the lower-middle portion of the Virgin River from the confluence with the Santa Clara until the confluence with Beaver Dam Wash, and the arid uplands of the Shivwits Plateau stretching south from the Santa Clara to the Colorado River and roughly from present Lake Mead in the west to the eastern edge of the Uinkaret plateau. Within this ecoscape, Paiute people moved freely back and forth between the oasis farmlands and the upland areas used primarily for wild-resource harvesting. The data indicates that the Santa Clara, and to a lesser degree the middle portion of the Virgin River, was the horticultural center and the population center of a district whose upland territories included the Shivwits Plateau in the south and upper watershed of the Santa Clara in the north (including the Pine Valley and the Bull Valley Mountains).

For whatever reasons (and more on this issue below), it was the Santa Clara River rather than the middle and upper Virgin River that apparently constituted the primary horticultural core of the Shivwits/Santa Clara district. This raises the question of whether there were smaller and perhaps subsidiary horticultural settlements on the middle and upper Virgin River and Ash Creek, or whether these settlements were independent. Information produced as part of this report suggests there were many villages along the middle Virgin River, and possibly a separate Southern Paiute district was located past the Hurricane Cliffs on the upper Virgin River.

When Father Escalante arrived on the middle Virgin River in 1776 he found Paiute agriculturists who called themselves the *Parussits* people. The name supposedly referred to the *Parussi* River, which they used to irrigate their farms. Esclante renamed the river the Rio Virgin. According to Bolton's (1950:205) translation of Escalante:

> ...in a small plain and on the bank of the river, there were three small corn patches with their very well made irrigation ditches...From here downstream and on the mesas on either side for a long distance, according to what we learned, live Indians who sustain themselves by planting maize and calabashes, and who in their language are called the Parussi.

Their name and the place of their agricultural communities being retained long after they left the middle Virgin River reflect the importance of the Parussits people. In 1936 Tony Tillahash told Presnall (1936:5) that the river we now call the Virgin, was known as the Pa-roos, "white foaming water." The Paiutes living along the lower part of the stream, below the I-oo-goo-intsn, were known as the Pa-roos-itsn. Tillahash's oral testimony also documents a distinction between the Paroosits and the I-oo-goo-intsn (see *Ua'ayukunants* discussion below). The relationship between agricultural communities on the middle and upper Virgin River cannot be established at this time because they largely disappeared by the mid-1850s, probably due to diseases. Still, agricultural communities did exist and it is suggested that the Parooits were a local group within the Shivwits/Santa Clara rather than within the *Ua'ayukunants* district. The Hurricane Cliffs is a formidable geological feature (see photo 2.1) that probably serves as a social-political divisional as well as an ecological boundary.

The Shivwits/Santa Clara people rebelled against Mormon domination but were forced to take refuge south of the Colorado River amongst the Northeastern Pai. About two-dozen Shivwits warriors fought beside the Pai in the Hualapai War of 1866-1869 (Dobyns and Euler 1970: 38; Dobyns and Euler 1971:18). Later these Shivwits/Santa Clara people returned to the north side of the Colorado River, but they remained culturally conservative in what might be called a *region of refuge* (Aguirre Beltran 1973) on the Shivwits Plateau. There they managed to make a meager living farming around springs, hunting and collecting in the upland portion of their traditional territory until a Mormon cattleman also acquired this portion of their land. The cattleman had sufficient political power to obtain Federal appropriations to purchase land on the upper portion of the Santa Clara River to relocate the refugee Shivwits/Santa Clara people. There their children attended an English language school, and were exposed to numerous Euroamerican influences, including more lethal germs. Close to St. George, the Shivwits reservation became the wageworkers' bedroom community, although the people farmed all the lands they could reach with their irrigation water allocation from the Santa Clara River. The Shivwits reservation attracted many Paiute people and became the home of famous Paiute leaders such as Uncle Sam, (pronounced Sham) after whom the reservation is nicknamed, and Tony Tillahash (who was born at Kaibab).

Today, the Shivwits/Santa Clara people are administratively united with four other Southern Paiute bands into the Paiute Indian Tribe of Utah (PITU). PITU was created by a 1980 Act of Congress, which accorded re-recognition to diverse small enclaves whose trust relationship with the Federal government had been terminated in 1954. The 1980 Act defines five local groups as members: (1) Koosharem, (2) Kanosh, (3) Indian Peak, (4) Cedar City and (5) Shivwits. The five local components of PITU elect delegates to a council, and a chairman. These representatives speak for all five groups and are the point of consultation between any project and one of the five groups (see Chapter Three).

Kaibab Paiute District

The Kaibab Paiute people irrigated gardens of maize, beans, and squash near permanent water sources. They also hunted and collected the fauna available in their ecologically diverse territory. They had gardens along the Colorado River at 2,300 feet. In addition they roasted agave (*yaant*) along the upper edges of the canyon, hunted deer (*Tuhi*) in the mountains of the

Kaibab Plateau at 9,000 feet, and gathered hundreds of acres of sunflowers (*akump*) and Indian rice grass (*wa'iv*) in the sandy foothills below the Vermillion Cliffs. They utilized all of the ecological zones within their territory.

The aboriginal boundary of the Kaibab district seems to be approximately where Kelly's Paiute interviewees placed it. The southern boundary of the district was certainly the Colorado River, probably extending downstream (south and west) from the Paria River to just west of Kanab Creek. Kelly's interviewees placed the northern boundary along the Pink Cliffs near the Paunsaugunt Plateau at the divide between the northern Colorado Plateau and the Great Basin. The western boundary, which incorporated both branches of the upper Virgin River, was marked with a dotted line indicating this boundary was probably unknown. Here, in this western-most portion of the Kaibab district lies a discussion about a missing Paiute district with a core oasis on the upper Virgin River (see *Ua'ayukunants* district discussion below).

The people of the Kaibab district lost access to these many portions of this ecological zone because of various types of intrusions, beginning in the early 1860s. Euler (1972), Stoffle and Evans (1976), and Turner (1985) provide detailed accounts of social, cultural, and ecological impacts of planned Mormon settlements, unregulated mining, and tens of thousands of cattle, sheep, and horses. Despite these intrusions and facing the loss of all but a fraction of their original population, the Kaibab Paiute people continued to reject Federal efforts to move them to distant reservations in Utah and Nevada. In 1907 the Mormon Church reserved a portion of the water from one of their larger artesian springs. In 1909 the Federal government reserved a 12-by-18-mile portion of land near the spring. Yet, it was not until the U. S. Land Claims payment occurred in the early 1970s that sufficient resources were available to the Kaibab Paiute tribe to begin building the economic and service infrastructure needed to provide jobs and housing for most of the tribal members. Today, the tribe has a viable and mixed economy, sufficient housing for all tribal members, and a strong concern for preserving cultural resources that are located within traditional Southern Paiute territory.

San Juan Paiute District

The San Juan Southern Paiute district constitutes the eastern-most territorial unit of the Southern Paiute ethnic group. Like all Southern Paiutes, the San Juan share an affiliation with the ethnic self-term *nungwu* or *nungwuts,* which translates into English as "The People" (Stoffle and Dobyns 1983a: 165; Franklin and Bunte 1993b:4). *Payuts* or *Payuts(i)* (Franklin and Bunte 1993b:4; Bunte and Franklin 1987:41), which is the Southern Numic term for Paiute, and variants of this second ethnic-self term are also used by Paiute people (Franklin and Bunte 1993b:4).

San Juan Paiute people occupied, and continue to reside in, their portion of traditional Southern Paiute ethnic territory. The San Juan Paiute local territory extended roughly from the Colorado River in the west to Monument Valley and Kayenta in the east, and from the San Juan River in the north to the Moenkopi Plateau in the south (Kelly 1964:167; Stewart 1942:233). Like citizens of a state incorporated into a nation, the San Juan people were not limited in movement or resource use to their local territory. In fact, the strength of the Southern Paiute Nation derived from the control and redistribution through exchange of resources grown,

gathered, and stored in extremely different ecological zones. So, the San Juan Paiutes went beyond their local territory to harvest wild game and plant resources in places like House Rock Valley west of the Colorado River and the San Francisco Peaks to the south. These trips were carried out under reciprocal use agreements with other Southern Paiute territorial units and other American Indian ethnic groups. These reciprocal use agreements were negotiated and cemented through a number of sacred and secular ceremonies such as round-dance ceremonials (Bunte and Franklin 1987:19).

Today, these people are organized and Federally recognized as the San Juan Southern Paiute tribe, which has its headquarters in Tuba City, Arizona. As an officially recognized tribe - now four years old - they have participated in a variety of cultural resource studies, some of which have been sponsored by the National Park Service. Like other Southern Paiute groups, their official tribal cultural concerns generally reflect their aboriginal district boundaries.

Ua'ayukunants District

Current data and the social and ecological logic of Paiute districts suggest that there was once a Paiute district on the upper Virgin River, beginning at Hurricane Cliffs and extending to the upper watershed where both branches of the Virgin River begin. The oasis core for this district was at or near the junction of the north fork and east fork of the Virgin River. This is an area that still has evidence of irrigated farming by Indian people so it could have supported a series of oasis core villages. The name for the people of this area is presently being spelled *Ua'ayukunants,* but it was spelled by Palmer (1978:29-39) as *I-oo-goone* and Presnall (1936:5) as *I-oo-goo-nitsn*. The name literally refers to a "sandstone quiver," and according to Tony Tillahash refers to a "...nearly complete circle of white cliffs seen from Grafton, Utah which looks like a sack or arrow quiver" (Presnall 1936:4-5). While this name could have referred to a local group within the Kaibab district, it would be a unique situation for a local group to control a larger and more regular water source than that controlled by the core oasis group - the Kaibab Paiutes. Instead of the *Ua'ayukunants* being a marginal group within the Kaibab district, evidence suggests they were the core oasis for their own district.

Further evidence for the existence of a "missing" district in the upper Virgin River portion of the Kelly and Kelly/Fowler maps is the unusual characteristics of the Uinkaret district. These people have been considered as different from the Kaibab Paiutes and the Shivwits/Santa Clara people since Powell began interviews in the area in the 1870s. In the 1930s, Kelly's interviewees maintained that the Uinkaret people had their own territory or district. When Kelly and Fowler reconsidered the Southern Paiute district boundaries in the 1980s, they found no evidence that would downgrade the Uinkaret district to a region of another district. So the question is not whether the Uinkaret held district lands, it seems to be whether their lands were connected with some other lands which formed a larger and more socially and ecologically logical district.

The main social and ecological logic behind connecting the Uinkaret district with lands somewhere else is that, as currently defined by Kelly/Fowler, it lacks an oasis core. The Uinkaret district had access to Colorado River waters but at a section of the river where agriculture would have been difficult at best. There are some small springs in Uinkaret land but they are few and

high in elevation. The natural argument is that the Uinkaret oasis core lies along the upper Virgin River. In fact, Kelly's own map brings the Uinkaret district boundary to just below the Virgin River, and at this point she drew a dashed boundary line indicating uncertainty.

If the agricultural core of the *Ua'ayukunants* was located at the confluence of the two branches of the Virgin River, they were the external boundaries. The northern and southern boundaries are rather easy to establish. The Colorado River clearly established the southern boundary of this district, and we believe the northern boundary was the divide between the northern Colorado Plateau and the Great Basin. All other districts in Yanawant extend from north to south and stopped at the watershed between the northern Colorado Plateau and the Great Basin. In fact, even Kelly's district map for the Kaibab Paiutes marks this watershed boundary as a solid line, indicating her interviewees' confidence in it as a boundary.

A more basic question is where was the eastern boundary of the *Ua'ayukunants* district? Does the eastern boundary include the upland forest lands of the upper Virgin River or should these resources remain within the Kaibab district as Kelly concluded? By the early 1900s there was living with the Kaibab Paiutes a people called the red-cliff-base-people (*Un-ka-ka-ni-guts*), a band that formerly lived in Long Valley in the headwaters of the East Branch Virgin River (Kelly 1934:558, citing Sapir's unpublished notes). The people from this band were probably forced to move to Kaibab because:

> In the late spring of 1871, 200 former Muddy River colonists united with other Mormon settlers and proceeded 300-strong to Long Valley. Advanced exploring parties had found 1,300 acres of tillable land and extensive ranges suitable for grazing (Arrington 1954:8). Their arrival resulted in land loss and population displacement (Stoffle and Evans 1978:11).

Powell and Ingalls (1874:42) estimated that 125 Paiutes resided in Long Valley in 1871, just before the Mormon immigrants arrived. By 1873, only 36 Paiutes remained in Long Valley. About two-thirds of the population was displaced to live with the Kaibab Paiutes. By receiving refugees from other areas/districts, the Kaibab Paiute became responsible to speak for the protection of these areas. Such admission of acquired territorial responsibility, however, did not necessarily imply that the red-cliff-base-people traditionally belonged within the district of the Kaibab Paiutes. Using the social and ecological logic presented in this report, aboriginally the upper watersheds of the Virgin River were within the territorial control of the *Ua'ayukunants* and the *Un-ka-ka-ni-guts* were a local band within that district.

The western boundary of the *Ua'ayukunants* district is shared with the Shivwits/Santa Clara district boundary. Much of this boundary has been "established" as the Hurricane Cliffs extending from the Colorado River and ending just before the Virgin River. The Hurricane Cliffs have a strong boundary logic that derives from being a 400 to 600 foot volcanic cliff, which is oriented north-to-south, and extends for a distance of almost 200 miles. For these reasons, among others discussed previously, we suggest that the entire western boundary of the *Ua'ayukunants* district is defined by the Hurricane Cliffs.

The question remains -- why did the *Ua'ayukunants* district go unrecognized by previous students of Paiute culture? There are probably four reasons for this. First, living in a riverine oasis, the people of the upper Virgin River must have experienced devastating impacts from diseases; perhaps they were impacted by the smallpox epidemic that hit on the Santa Clara River in 1826 and likely they were hit by the 1840 disease episodes. Interviews conducted as part of this study (see Chapter 5) reveal oral accounts of massive deaths among the people of the upper Virgin River. Second, it was one of the earliest places of Euroamerican settlement, beginning here in 1859, and there simply were not enough Indian people living in the core oasis to defend it from encroachment. The *Un-ka-ka-ni-guts* (red-cliff-base-people) was the last band to be forced out of the upper Virgin River in 1871. Third, when *Ua'ayukunants* people were interviewed in the 1870s, they still defined the southern forest uplands of the Colorado Plateau as their own; only they used the upland term *Uinkaret* for themselves and the remnants of their district. Fourth, when loggers (1880s) and cattlemen (1890s) encroached upon the Uinkaret district, the last Uinkaret people left the *Ua'ayukunants*. According to Paiute elder interviews, some Uinkaret people went to live with Shivwits/Santa Clara relatives and others went to live with the Kaibab Paiutes. So when Kelly interviewed at Kaibab in the 1930s, she talked with people who only remembered that their families lived in the Uinkaret uplands of the *Ua'ayukunants* district.

Summary

The Southern Paiute people continue to maintain a strong attachment to the holy lands of their ethnic group as well as to their own local territory. These attachments continued even though Paiute sovereignty has been lost over portions of these lands due to Navajo ethnic group expansion, encroachment by Euroamericans, and Federal government legislation. Despite the loss of Paiute sovereignty over most traditional lands, Southern Paiute people continue to affiliate themselves with these places as symbols of their common ethnic identity. Additionally, all Southern Paiute people continue to perform traditional ceremonies along with the menarche and first childbirth rites of passage rituals. The locations at which these ceremonies and rituals have been or are currently performed become transformed from secular "sites" to highly sacred locations or places. By virtue of the transformation of locations into sacred places, Southern Paiute people reaffirm their ties to traditional lands because they have carried out their sacred responsibilities as given to them by the Creator. Southern Paiutes can be characterized as a "persistent people" (Spicer 1971) with a persistent cultural system (Bunte and Franklin 1987; Stoffle and Dobyns 1983; Stoffle and Evans 1976; Stoffle et al. 1982; Turner 1985; Turner and Euler 1983).

Kelly and Fowler (1986) identified sixteen Southern Paiute "groups." Their term "group" corresponds to the term "district" used in this report, though the data suggests some modifications to the list of groups developed by Kelly and Fowler. New data, some of which is presented in this ecosystem analysis, suggest that three additional districts should be added to Kelly and Fowler's list. These include (1) the Pahvants as the northernmost Southern Paiute district (Halmo, Stoffle, and Evans 1993), (2) the Ash Meadows/Pahrump Southern Paiutes as the western-most district (Stoffle, Olmsted, and Evans 1990), and (3) the Ua'ayukunants/Uinkaret Southern Paiutes. With these modifications, the list of a dozen districts comprising the Southern Paiute nation would include the following:

Paranayi Subtribe

Ash Meadows/Pahrump district
Chemehuevi district
Las Vegas district
Moapa/Pahranagat district

Yanawant Subtribe

Shivwits/Santa Clara district
Ua'ayukunants/Uinkaret district
Kaibab district
Kaiparowits district
Antarianunts district
Panguitch district
Cedar City/Indian Peaks district
San Juan district
Pahvant (Beaver) district

The Eastern Yanawants

In this next section we examine fundamental disruptions occurring in the eastern portion of the Yanawant Region, which consists of the San Juan, Kaibab, and Kaiparowits districts. This analysis is based upon historical documents including traveler accounts, personal journals, historical maps, census materials, and geological and geographic documents. We begin this analysis with an investigation of the Spanish Trail, which played a particularly significant role in altering the landscape as well as the lives of the Southern Paiute people living in the districts of San Juan, Kaibab, and Kaiparowits.

Pipelines of Disruption

Perhaps one of the greatest ironies underscoring the official histories of the Eastern Yanowant portion of the Southern Paiute Nation is the belief that the lands within this locale comprised some of the most isolated and buffered regions within the southwest. Underlying this idea is the presumption that the indigenous people of San Juan, Kaibab, and Kaiparowits were largely immune to the impacts of Spanish, French, and American expansionism until after the middle of the eighteenth century. Such accounts generally note brief but allegedly non-significant encounters between certain Southern Paiute people of the Yanawant territories and members of Escalante's expedition of 1776 or those who traveled along portions of the Old Spanish trail during the early 1800s (Euler 1972:11).

Histories founded upon late-contact theories fail to acknowledge the way in which the Old Spanish Trail, Escalante's Route, and Armijo's Trail acted as pipelines which did more than simply forge connections between the Spanish outposts in Santa Fe and Abiquiu, New Mexico and California. In addition to providing routes circuiting through and around the Eastern Yanawant region of the Southern Paiute Nation, these trails acted as pipelines through which

Spanish, American, and French people, material culture, ideologies, and diseases spread (Sanchez 1997:119). In addition, though the Spanish Trail and Escalante's Route became increasingly active after Escalante and his party traveled through Eastern Yanawant territories in 1776, traffic into the eastern portion of the Paiute Nation occurred prior to Escalante's expedition.

The Old Spanish trail consisted of a series of Indian trails that came under heavy use by Spanish explorers and traders after the establishment of settlements in Santa Fe and Abiquiu. Hafen and Hafen (1993:11) note that Indians frequently guided the early Spanish travelers through their lands, thus confirming knowledge and familiarity on the part of the guides, and geographical and ecological nescience on the part of the early Spanish explorers.

The Spanish used the Old Spanish Trail to accomplish two primary agendas. First, they sought to increase their wealth through the development of commercial trade, and secondly they desired to develop routes that would connect the people in Santa Fe and Abiquiu with the distant Spanish outposts in California. In addition to providing a route that was heavily used by travelers whose commercial interests were frequently pursued without regard to the needs and desires of those who had lived in the Eastern Yanawant regions for thousands of years, the Old Spanish Trail worked as a conduit for disease dispersal.

1625-1830

During the 1600s, caravans were regularly organized to transport people and goods from Mexico City to Northern New Spain and the capital at Santa Fe, which along with Abiquiu served as the eastern terminus of the Old Spanish Trail. Archival documents confirm the presence of disease among the people traveling in mission caravans from the northern outpost of Santa Fe as early as 1625. According to Reff (1991:167),

> The mission caravan that was assembled or passed through Aacatecas early in 1625 (Sholes 1930:94) may very well have brought the (smallpox) epidemic to New Mexico. Like their commercial counterparts, the mission caravans were escorted by a detachment of soldiers and consisted of thirty or more wagons, each which carried close to 4,000 pounds of goods. A large herd of cattle, draft animals, and mules accompanied each caravan, as did settlers, traders, missionaries, and others bound for the north (Moorhead 1958:33). Significantly, the contract for the mission caravan of 1625 indicated that 900 pesos were spent on medicine and drugs. This is a substantial amount, given that the entire cost of the caravan was a little over 18,000 . . . (Hodge et. all 1945:109-24). The contract [also included] …four-dozen hens for those who may be sick during the journey (Scholes 1930:102).

Upon arrival to Santa Fe, the transmission of disease, material culture, and people followed routes of trade that branched out into a number of directions. Through the Old Spanish trail, Escalante's Route, and Armijo's trail, the impacts of Spanish invasion manifested in certain areas within the eastern regions of the Southern Paiute Nation.

The development of commercial interests beyond Santa Fe was particularly attractive to many of its residents. Established as the second capital of New Mexico by decree of the Spanish crown in 1609, Santa Fe remained a fairly impoverished outpost in the hinterlands of the Spanish Empire. Over the first several decades the population of Spaniards residing in Santa Fe rose from several hundred to more than a thousand. However, increased wealth was not concomitant with increased size. Bannon (1974:41) notes that the residents of Santa Fe "were never very prosperous".

In the absence of local wealth, traders and trappers residing in Santa Fe began turning in larger numbers to the possibility of accumulating wealth beyond the territory they had previously usurped from local indigenous groups. While the possibility of accruing wealth through trade was alluring, it was not without risk. During the Spanish period, the crown sought to control trade as closely as possible in order to maximize its own profits. Middlemen *empresarios* were appointed to oversee the activities in the Spanish colonies, and thus ensure profits for the crown. As the *empresarios* were not paid for their services, they were in the unique position of trying to police the trading enterprises of others while simultaneously turning a profit for themselves. As late as 1809, many of the people who tried to open trade "were not only repulsed, but imprisoned"(Hafen and Hafen 1993:91).

Despite restrictions, Santa Fe developed into an active center of trading. Many indigenous people within and outside the region officially designated as the territory of New Spain began to circulate Spanish material goods through elaborate networks of trade. After 1700 Indians in regions as far as the Dakotas and Montana had acquired Spanish horses and material goods through such channels of commerce. Through a similar chain of exchanges it is probably that the Southern Paiutes of San Juan, Kaibab, and Kaiparowits first came into contact with the material culture as well as the viruses and bacteria carried by the New Mexican Spaniards. From Santa Fe and Abiquiu, the Old Spanish Trail, Escalante's Route and Armijo's Trail passed into portions of the Eastern Yanawant territories of the Southern Paiute Nation.

The exact dates of the earliest contacts between people of San Juan, Kaibab, and Kaiparowits and the Spaniards are unknown. Reff (1991:276) however, has verified that in the seventeenth century, virgin soil epidemics, and diseases had already radically reduced Hopi populations with whom certain Southern Paiute people were known to have contact (Hafen and Hafen 1993:59) and engage in trade (Euler 1973:16). "The Francisan historian Vetarcurt (1961:276) noted in his Chronica, which was completed in circa 1690 that the Hopi numbered more than 14,000 and that this number had been greatly reduced by disease prior to missionization" (cited in Reff 1991:167).

A traditional Indian route connecting Hotevilla, Bacabi, and Oraibi with the settlements in northwestern New Mexico could have further catalyzed the exchange of material goods and disease that would later permeate into the Eastern portions of Yanawant Territories (Ortiz 1983: 719). The primary route from the Hopi mesas to New Mexico crossed the Chinle Wash as well as the San Juan River, where it is conceivable that trade with Paiutes, Utes, and Navajos may have occurred.

Hopi individuals were also known to attend trade fairs in Taos, Abiquiu, and Pima. At these fairs "Trade caravans from Mexico . . . came to obtain native products - hides, jerked meat, salt, horses and slaves" (Ortiz 1983: 719). Those who had experienced radical depopulation due to disease would have congregated with travelers at the terminus of the Old Spanish trail, from whence further trading activities into Eastern Yanawant territories frequently commenced.

In addition to participating in trade fairs which would catalyze the exchange of material goods, the Hopi were known to establish certain trade partnerships through the exchange of presents and a symbolic performance with entailed "put[ting] their arms around one another and mutually inhal[ing] each others breath" (Beaglehole 1937:84 cited in Ortiz 1983: 718). In the presence of disease, such customs would have proven lethal.

By 1775, relations between Hopis and Spaniards had soured considerably. While preparing for his expedition in 1775, Escalante met with Moquis who "were sullen [because] they had had more than enough contact with Spaniards" (Hafen and Hafen 1993: 59). Fearing retribution on the part of the Hopis, Escalante and his party decided to avoid travel through Hopi and Apache territories. In 1776, they began a journey in which they mapped and recorded their observations upon Indian trails that "closely follow[ed] the modern Highway U.S. 84 from Santa Fe to the Colorado border and U.S highway 160 beyond" (Hafen and Hafen 1993: 70). After circuiting through Ute lands as far west as Milford, Escalante, Dominguez and their company circled back to Santa Fe upon a route going "southward into the "Arizona Strip"; turned east, skirted the Kaibab Plateau, and forded the Colorado River at the "Crossing of the Fathers" (Hafen and Hafen 1993:72).

Escalante's party chose a route through the Kaibab region of the Eastern Yanawant territory that entailed journeying through Kanab toward the Paria River and The Crossing of the Fathers. Prior to arriving in Kanab, they traveled from Hurricane Wash towards Bull Rush Wash where they arrived on October 20. Soon afterwards, they arrived at a permanent settlement of Southern Paiutes, with whom they traded cloth and spent the night (Sanchez 1997:76).

While travelling through the northern stretch of the Kaibab Plateau, they met up with many Southern Paiutes (Euler 1972:16). The people whom Escalante and his party encountered were skilled in agriculture and medicine. They typically owned and occupied lands near perennial streams, and frequently lived in small settlements, which allowed them to meet their physical needs without overtaxing the resources of their environment.

At the settlement east of the present town of Kanab, some Kaibab Southern Paiutes fed the explorers and also practiced traditional healing methods upon one of the ailing travelers, Don Bernardo Miera y Pacheco. It is interesting to note that the Catholic missionaries permitted a Southern Paiute medicine man to use "songs and ceremonies" in order to elicit a cure (Euler 1972: 16). Considering the orthodox views held by the Escalante and Dominguez, it is probable that Don Bernardo was seriously ill at the time he came into contact with the this Kaibab Paiute group. Were he not, it is improbable that these missionaries would have allowed a Paiute medicine man to practice his healing arts upon a fellow Christian traveler.

Though Escalante does not specify the type of illness from which Don Bernardo suffered, it is conceivable that he may have infected the Southern Paiute people with whom he had contact. Sanchez (1997:61) notes that other members of the Escalante party had also suffered from "headaches, colds, fevers, and exhaustion", thus confirming that the party was carrying germs against which the people whom they came into contact may have had no immunity.

Over the next two and a half weeks, Escalante and his party traversed lands within the eastern portion of the Yanawant territory. Upon arriving at the conjunction of the Paria River and the Colorado, they sought a way to cross the Colorado. After many failed attempts, they finally found a means of crossing the Colorado River at the Crossing of the Fathers, from whence they resumed their journey back to New Mexico.

Though illicit trading activities between Spaniards and indigenous people had occurred prior to Escalante's expedition, a second wave of illicit trading quickly ensued after Escalante and his party returned to Santa Fe. Both the publicity of Escalante's journey and his detailed accounts of the land through which he traveled may have made Escalante's route particularly appealing.

The illegal trading activities frequently centered on the enslavement of individuals who were often captured by Utes and taken to trading centers in Santa Fe and Abiquiu. After 1776, a rash of illicit trading was noted amongst the citizens of Santa Fe and Abiquiu. Among the offenders was a "group of Abiquiu citizens (who) were sued for having traded with the Utes (in 1783)" (Hafen and Hafen 1993:262). By September 13, 1778 Spanish officials issued a *bando* that legally "prohibit(ed) settlers and Christianized Indians from visiting the Utes for trade and barter" (Hafen and Hafen 1993:262, Sanchez 1997:91).

Despite these official edicts, a large and seemingly uncontrolled circuit of illegal trading between Spaniards and particular Indian groups continued, and by the early 1780s trade between the Utes and Spaniards was reportedly flourishing (Sanchez 1997:93). This is evidenced in a series of accounts that enumerate the repeated violation of commercial prohibitions. Vincente Serva and Cristoval Lovata are but two of the traders who were brought to trial for ignoring the *bando* that prohibited commercial trade (Hafen and Hafen 1993:262).

It is probable that some of the people of the Eastern Yanawant region experienced changes concomitant with Spanish conquest several decades before the 1778 *bandos* were enacted. According to Hafen and Hafen (1993) trade relations between Utes and Spaniards were well established by the early 18th century. They note that "trade relations had been established some years before the [1680 Pueblo Revolt] uprising." In addition Sanchez (1997:28) observes that the Spanish had been traveling into portions of the Great Basin to trade with the Utes since the time of Juan de Rivera's explorations in 1765. Moreover some of the men on Escalante's expedition of 1776 were already fluent enough to converse with the Utes whom they encountered upon their travels.

The trading between Utes and Spaniards frequently entailed the exchange of "buckskin, dried meat, furs, and slaves to barter for horses, knives and blankets (Hafen and Hafen 1993:84). In addition "knives, corn, tobacco, horses, flour awls" (Sanchez 1997:97) were often used as

items of exchange. Though much trade was conducted in Santa Fe, many traders went directly into Eastern Yanawant in order to increase their wealth. Hafen and Hafen (1993:267) note "the evidence is clear that the Indians, at least as far as the Sevier River of Central Utah, were acquainted with the Spaniards and were accustomed to trade with them as early as 1813".

After Mexico declared independence from Spain in 1821, "many of the Old Spanish *bandos* were only weakly enforced, and New Mexicans continued to go to the Yuta country" (Sanchez 1997). Hafen and Hafen (1993:92-3) suggest that Mexican Independence opened a new era in the southwest. The Old Spanish Trail...was in a sense, an extension of the earlier Santa Fe Trail [that was soon to be pushed to Los Angeles] . . . but more important in effecting the completion of the Old Spanish Trail was the fur trade".

The next major phase of intrusion into Eastern Yanawant territories began with the commercial ventures of Antonio Armijo. Begun in 1829, his story signals a new phase of activities that centered around the development of a route which succeeded in linking the distant settlements of New Mexico and California through the southerly portions of the Eastern Yanawant territories.

1829-1848

The people living in the Eastern Yanawant region experienced a second wave of radical change through the legalization of Spanish trade along trails that encroached upon their territories. This phase of activity gained it impetus through the travels of Antonio Armijo that began in 1829. Unlike earlier trading activities along the Old Spanish Trail, the state sanctioned the explorations of Armijo and his party. In 1829 the people of this expedition set out from Abiquiu, New Mexico with the intention of establishing a viable trade route from Abiquiu, New Mexico to Los Angeles, California. Rather than following The Old Spanish Trail or the Escalante route, Armijo and his party sought a more direct passage across the southern borders of the present day GS/ENM. Like Escalante, Armijo chose a route that involved traversing the Colorado River at the Crossing of the Fathers and following a west bound trail towards the present day settlement of Kanab.

Though the primary purpose of Armijo's expedition was to develop a commercial connection between Abiquiu and Los Angeles, other agendas were pursued as well. In addition to establishing a trading route between these distant settlements and promoting commercial interests, the *empresarios* used this journey as a scoping mission wherein they "note(d) the various products that the territory of the Mexican Republic possess(ed) in this region . . [Through their observations they determined] that there exist(ed) suitable locations for establishing new villages and that in the hills there appear(ed) variously colored rocks or veins resembling minerals, some of the said hills having the shape of elevated bufas without forest or grass land, streaked with veins or rock strata" (Hafen and Hafen 1993:156-7).

The trade route followed by Armijo and his party was not totally unknown to people living in New Mexico. "Much of the territory northwest of New Mexico had long been familiar to the Spaniards who, in seeking furs and Indian slaves, had followed the trails leading northwest into the country of the Utes" (Hafen and Hafen 1993:155-6). As the Spanish Crown did not

sanction many of these operations, few trappers and traders kept extensive records of their activities. Despite a relative dearth of information regarding parts of Eastern Yanawant territories, Armijo's party was able to glean some information from the records taken by Jed Smith during his 1826 and 1827 journeys. It is probable that Armijo's party gathered information from other trapper's journals as well. In addition, they employed Navajo guides to serve the dual purpose of leading them through unfamiliar territories and providing protection from attacks by certain Indians living in the areas through which they traversed.

The journey of Armijo and his 30 men is described in a newspaper article from Santa Fe, New Mexico dated April 28, 1830. The author notes, "The gentiles of the *Payuche* [Paiute] Nation inhabit the vicinity of the above mentioned river [the Colorado River]. Their living quarters are *jacales* [huts], and they live on grass seeds, hares and rabbits, using the skins of the latter to cover a small part of their body. There follow various other nations inhabiting these lands: the Narices Agujeradas (Pierced Noses) . . . the Garroteras, dexterous in handling a four-edged garrote (stick); the Ayatas dressed in buckskin . . . (who) cultivate fields . . . (and) dress . . . like the preceding ones" (Hafen and Hafen 1993:157). The Spanish word *Ayata* derives from *ayote*, which means pumpkin or squash, thus indicating the centrality of agriculture within this community. The newspaper account goes on to state that "None of the above mentioned nations attacked the travelers" and some fled when Armijo and his men approached (Hafen and Hafen 1993:157).

The defensive posturing of some of the people whom Armijo and his party met indicates that prior to their arrival in 1829, other travelers had entered into their lands and proven themselves unworthy of their trust. It is probable that the many of the nations who encountered Armijo and his company were familiar with the illicit trading operations practiced before 1829 (Hafen and Hafen 1993). Under such conditions, reservation on the part of the groups whom Armijo encountered suggests an adaptive strategy aimed at preservation.

Under the lead of a Navajo guide, Armijo and his party traversed the Colorado River at the Crossing of the Fathers after which they took a westbound trail that crossed the Paria River and continued west towards Kanab. On the thirtieth of November 1829 they met three Indians "at the water hole of the Payuches (Paiutes). No trouble ensued, and it was necessary to scale a canyon . . ." (Hafen and Hafen 1993:160). On December 1, 1829 they arrived at the lake of Las Milpitas (The Little Corn Patches) before working their way down a canyon (Hafen and Hafen 1993:160).

Eight days later (December 8, 1929) they stayed at Blanco (White) Canyon where they noted a permanent water supply. The following day they arrived at the artenejal of Ceja Colorado (Red Ridge) where they found another settlement of Payuches (Paiutes). The Red Ridge described by Armijo is "near present Wahweap Canyon . . . (and) the Paria Creek" (Sanchez 1997:105).

Armijo described the group of Southern Paiutes whom he met as a "gentle and cowardly nation" (Hafen and Hafen 1993:163), once more reaffirming the likelihood that these individuals had already encountered Spanish and/or Anglo travelers under conditions that were disadvantageous to the welfare of the Southern Paiute people. In addition, Armijo uses the word

'Nation' to describe the group of Southern Paiutes whom he encountered. His wording suggests that rather than meeting with a small number of Southern Paiute individuals, Armijo encountered a sizeable group of people who displayed both social organization and group cohesiveness.

On the 19th of December 1829, Armijo and his party stopped at Stinking Water Canyon where they found another permanent supply of water. This may be the site identified by Kelly's consultants as Piki-pa or Rotten Water (47) (Kelly 1971:9). A day later, Armijo and his company arrived at the Severo (Sevier) River, and on the 23rd of December 1829, they arrived at Calabacillas (Little Wild Squash) Arroyo, a name that strongly suggests the presence of indigenous agricultural activities (Hafen and Hafen 1993:163).

After reaching the Calabacillas Arroyo, the expedition continued along trails that are beyond the scope of the present study. However, two factors relating to the remainder of Armijo's expedition deserve mention. First, the latter groups of Paiutes, Hayatas, and Moquis whom Armijo and his men encountered all reportedly displayed a gentleness that was interpreted as weak behavior, thus suggesting that the exploitation of these groups through the slave trade was quite pervasive. Secondly, the agricultural and trading activities of the groups whom Armijo's party encountered were only peripherally recognized while their organization, knowledge, and connections to the lands that accrued through these activities even less fully acknowledged.

Though the residents of the GS/ENM were partially protected from the exploitive plans of the Spaniards and Anglos through the geographic remoteness and ruggedness of the desert landscape comprising the GS/ENM, they were not untouched by the processes of change resulting from Spanish and Anglo encroachment. In addition to the importation of virgin epidemic diseases and the slave trade, the Southern Paiutes of the GS/ENM had to contend with Navajo raiding parties. According to Gregory (1950:17) "Navajo hunting parties from across the Colorado frequently visited the Paunsaugunt region in search of pelts and doubtlessly molested the "few" resident Piutes".

After Antonio Armijo conducted his expedition, the state officially sanctioned commercial trade between the settlements of New Mexico and California. "Armijo's route quickly became the favored route to California for the next twenty years, as New Mexicans used it as a trade and immigration trail to the west coast" (Sanchez 1997:104). Both legal trading and illicit trading continued on with little abatement. The ineffectual efforts on the part of Spanish officials to enforce their *bandos* indicate that a state of relative lawlessness pervaded the Spanish outposts. In addition, the government either lacked the strength or the support to uphold the laws of the land.

Though it has yet to be confirmed, it is possible that the exchange of cloth between the distant posts of Santa Fe and Los Angeles also catalyzed the spread of disease. The legalized trade route that opened as a result of Armijo and his party's efforts centered the exchange of "blankets and other trade goods . . . [which they] hoped to barter for mules in California" (Sanchez 1997:104). According to Reff (1991:123):

> "Spaniards, Indians, and slaves (are) not the only disease vectors. Textiles, particularly cotton, can . . . harbor smallpox. Moreover, there is some evidence that the measles and influenza viruses can be transmitted in textiles (May 1958). Reff (1991) also notes that, "cotton, wool, and cloth of varying quality and manufacture were imported in large quantities by the Jesuits (Polzer 1972:234-39) and the Franciscans (Scholes 1930:100,187)".

When one considers the primacy of cloth exchange between Santa Fe and Los Angeles and the suitability of cloth for carrying disease, the idea of disease transmission through this legalized form of trade becomes highly plausible.

In 1830, heavy commercial traffic continued upon the Old Spanish Trail (Euler 1972:33). Heavy trading was also promulgated along the routes previously delineated by the Indian guides of such expeditions as those undertaken by Escalante and Armijo. In addition to serving as a probable disease vectors, trade along these routes resulted in the destruction of natural vegetation upon which certain Southern Paiute people depended upon for their survival. This destruction resulted from the movement of cattle and horses through regions wherein a delicate balance that had been previously established amongst the plants, animals, people and land was seriously disrupted.

As late as April of 1848, Brewerton witnessed a caravan traveling along the Old Spanish Trail. This procession consisted of:

> "...Some two or three hundred Mexican traders who go once a year to the Californian coast with a supply of blankets and other articles of New Mexican manufacture; and having disposed of their goods, invest the proceeds in Californian mules and horses, which they drive back across the desert. These people often realize large profits as the animals purchased for a mere trifle on the coast, bring high prices in Santa Fe. This caravan had left had left *Pueblo de los Angeles* some time before us, and were consequently several days in advance of our party upon the trail- a circumstance that did us great injury, as their large *caballada* (containing nearly a thousand head) ate up or destroyed the grass and consumed the water at the few camping grounds upon the route" (cited in Hafen and Hafen 1993:192).

As a result of travel along the Old Spanish Trail, Armijo's Route, and Escalante's Route between 1829 and 1848, the land, vegetation, and health of Southern Paiutes living in the Eastern Yanawant Territories was detrimentally impacted. Southern Paiutes who had occupied these regions for thousands of years suddenly found that the land, vegetation, animals, and waters upon which their survival depended were being incrementally destroyed. The people who entered into portions of the Eastern Yanawant Territories during this time began to compete with Southern Paiutes for the use of limited resources. Next, Southern Paiutes were exposed to diseases to which they lacked immunity. Those who entered portions of the Eastern Yanawant Territories failed to recognize the legitimacy of lifestyles assumed by the indigenous groups whom they encountered. As a result, activities pursued by certain Spanish, New Mexican, and Anglo individuals and groups were given primacy over the needs of the Southern Paiutes living within the Eastern Yanawant Territories.

While the journeys of many traders have been forgotten, those of Escalante and Armijo have been remembered. This is due in large part to two factors. First, both Escalante and Armijo were encouraged to carefully record their observations of their journeys. In contrast, many of the traders and trappers who came before Escalante and Armijo acted without the approval of either government or church officials. It was in their best interests to keep themselves and their records relatively secret. Second, as both Escalante's and Armijo's journeys were officially sanctioned by state and church officials, it is probable that more effort went into preserving their records than might be expected of the records kept by private individuals.

1848-1858

The processes and events of the next decade represent a third phase of incursions by Spanish and Anglo groups upon the lives of indigenous groups living in the Eastern portion of the Yanawant Territories. This wave of events largely began with the signing of the Treaty of Guadalupe Higaldo in 1848, officially signaling the end of the war between the U.S. and Mexico. As a result of this treaty, the Mexican government ceded much of the territory the Spanish government had previously usurped from indigenous people, to the United States. In addition, the Rio Grande River became the southern boundary of Texas, and the areas which would become the territories of California, New Mexico, Arizona, Utah, Nevada, as well as portions of Colorado, Wyoming, Oklahoma, and Kansas came under U.S. dominion. Finally, the U.S. paid Mexico $15 million while making $3.25 million in claims against Mexico (Barrons 1993:10-39).

The second major change of this decade resulted from the Gold Rush of 1849. Previous Spanish and Mexican routes to California had either gone through or near the Eastern Yanawant Territory by means of the Spanish Trail, the Escalante Route, and Armijo's Trail. In contrast, the route of the Anglo American Forty-niners began in St. Louis, Missouri and continued west through Salt Lake City and down to Los Angeles upon a trail along the western side of the Wasatch Mountains. The viability of wagon travel along the Anglo trail of the Forty-niners was particularly important in shifting the primary flow of traffic away from the Eastern Yanawant territories towards a northern route that passed through Salt Lake City and continued on to California (Hafen and Hafen 1954).

Impacts of the Treaty of Guadalupe Higaldo

The Treaty of Guadalupe Higaldo signaled one of the first stages in a process that led to a shift in both governmental and regional powers within lands that included the Eastern Yanawant Territories. Prior to the enactment of Treaty of Guadalupe Higaldo and the arrival of the first Mormon settlers into the traditional lands of the Southern Paiutes, Utes, and neighboring tribes during the late 1840s, Santa Fe had acted as a dominant center of governmental, church, and mercantile power. The influence of Santa Fe influence spread through a network of trails linking areas as distant as Mexico City, St. Louis, and Los Angeles. However, once the US gained control of these territories and Mormons began to enter the lands of Southern Paiutes and Utes in increased numbers and frequency, dramatic restructuring of state, commercial, and religious powers began to occur in both rapid and incremental steps.

In addition to the modification of international boundaries effected through the Treaty of Guadalupe Higaldo, the newly established theocratic state of Deseret began to alter the form of its institutions as well as its relations to federal powers. This process began with the development of a strong centralized governmental and church body politic headquartered in Salt Lake City. "The Mormons envisioned their own theocratic state as combining both secular and sacred functions" (Holt 1992:24). Moreover, "All things merged in the church. It was the legislative, judicial, and executive body operating through its delegated ministry. It embraced all things, secular and civil" (Evans 1938:94 cited in Holt 1992:24).

When Mormon pioneers began arriving in Salt Lake Valley in 1847, they came with the intention of establishing a Holy Land whose boundaries would encompass all of the lands within the Great Basin. Though the Great Basin constituted the homelands of many indigenous groups and was also claimed as part of the Mexican territories at the time the Mormon settlement, leaders of the church "intended to claim the area for the United States and petition for statehood" (Arrington 1958:41). Upon arriving in the Salt Lake Valley they planted an American flag, and in July of 1848, "church officials in Kanesville . . . petitioned Congress for a Mormon territorial government" (JH, October 10, 1848 cited in Arrington 1948:42).

The Mormons' desire for political recognition revealed itself again in 1849 when leaders of Deseret petitioned the U.S. federal government for statehood. In this petition, the Mormon officials laid claim to all of lands within the Great Basin. Soon after submitting their request their petition was denied. However, in 1850 members of the U.S. Congress chose to recognize a considerably smaller version of Deseret, which constituted the territory of Utah. This territory included the lands that would later become "western Colorado, Utah, and Nevada, with the forty-second parallel as the northern boundary and the thirty-seventh as the southern boundary" (May 1987).

The Mormons also sought to augment their authority at a regional level. In order to accomplish this goal, they needed to increase their control over trading routes that entered into the Eastern Yanawant territories from Santa Fe and Abiquiu. For over a century Spanish and New Mexican traders held a virtual hegemony over trading activities within areas that included the Eastern Yanawant Territories. When Mormons first arrived in the Great Basin, lucrative networks of commerce between Santa Fe and Abiquiu traders and neighboring Utes were already well established. Many of these commercial networks involved trade relations with Ute parties who regularly entered into portions of the Eastern Yanawant lands in order to procure resources or capture individuals to be sold into slavery.

In the late 1840s Mormon pioneers who had begun to colonize areas within the Great Basin began challenging commercial dominance over regions that included the Eastern Yanawant Territories. Sanchez (1997:130) notes that "Two events hastened the end to the New Mexican dominance of the Yuta trade: the settlement of Utah by the Mormons and the Mexican War of 1846". As a result of the 1848 treaty as well as legislation passed in the newly established state of Deseret between 1851 and 1855, trade within the Eastern Yanawant Territories as well as commercial markets linking the Eastern Yanawant Territories to the territories of New Mexico and California underwent significant alterations.

After the signing of the Treaty of Guadalupe Higaldo in 1848, Mormon leaders began to pass legislation aimed at systematically curtailing the trading practices of New Mexicans within the Eastern Yanawant and Ute territories. One of the primary means of controlling trade in the newly decreed state of Deseret entailed the prohibition of slave trade from Santa Fe and Abiquiu along portions of the traditional trade routes of the Old Spanish Trail, Escalante's Route, and Armijo's trail.

Between 1851 and 1855, Deseret courts passed a series of laws prohibiting Indian slave trade (Sanchez 1997:132). As slaves were regularly procured through Utes or through the direct capture of indigenous people living in the Eastern Yanawant territories and surrounding vicinities, these restrictions held the potential to undermine one source of encroachment which certain Southern Paiutes and neighboring tribes encountered on a regular basis.

In 1851 and 1852, New Mexican trading parties were brought to trial in Deseret courts, and summarily denied license to trade with the Utes for Indian slaves. Though the New Mexicans had licenses issued by New Mexican officials, the acting governor of the newly formulated territory of Utah, Brigham Young, did not recognize these as valid. According to a report issued by the Mormon Judge Zerubbabel Snow of the First District Court:

> "In September last, twenty-eight Spaniards left New Mexico on a trading expedition with the Utah Indians . . . they sent some five or six of their leading men to see Governor Young, and exhibited to him their license; and as the Spanish witness said that if it was not good here, then to get from him another license. Governor Young not being at home, but gone south, they proceeded after and found him November 3rd at Sanpete Valley. Here they exhibited to the Governor their license, and informed him they wished to sell their horses and mules to the Utah Indians, and buy Indian children to be taken to New Mexico. Governor Young then informed them that their license did not authorize them to trade with the Indians in Utah. They then sought one from him, but he refused it, for the reason that they wanted to buy Indian children for slaves" (cited in Sanchez 1997:131).

In this 1851 case Pedro Leon and his seven men were denied permission to trade slaves, and in 1852 Jose Maria Chaves reportedly met with similar responses (Sanchez 1997:131). In both cases the captured individuals were freed, and the slave traders returned to New Mexico. However, despite new restrictions on slave trading in the eastern portions of Yanawant and Ute territories, slave trading did not abate. In 1853, New Mexican traders led by an Anglo known as Dr. C.A.W. Bowman reportedly began to "openly trade weapons and provoke Indian hostilities towards Mormon settlers" (Jones 2000:8). In response to these actions Brigham Young issued a proclamation on April 23, 1853 in which he stated:

> "Whereas it is made known to me by reliable information, from affidavits, and various sources, that there is in this Territory a horde of Mexicans, or outlandish men, who are infesting the settlements, stirring up the Indians to make aggressions upon the inhabitants, and who are also furnishing the Indians with guns, ammunition, etc., contrary to the laws of this Territory and the laws of the United States . . . The office and party hereby sent upon this service are authorized and directed to arrest and keep in close custody every strolling Mexican party, and those associated with them . . . (Moreover) all Mexican(s)

now in the Territory are required to remain quiet in the settlement and not attempt to leave under any consideration" (cited in Sanchez 1997:132).

Though this proclamation and the series of laws passed between 1851-1855 did not eliminate slave trading, the control which New Mexican traders had previously exercised over the Eastern Yanawant and Ute territories was called into question and partially altered as a result of these measures.

After 1853, much of the slave trading between Utes and New Mexicans went underground. In addition, when the legalized slave trade of Indians was prohibited in the newly established state of Deseret, New Mexican traders began to capture and sell individuals outside of the Eastern Yanawant Territories with greater frequency. The Navajos were particularly impacted by these practices. So pervasive was slave trading of captured Navajo people that in 1868 the Navajo Chief Barbocito claimed that over half of his tribe was in captivity (Jones 2000:32). In addition to turning to commercial trading in regions beyond the immediate jurisdiction of Deseret, some of the Utes of the newly established Utah Territory endeavored to develop their trading relations with the members of the Mormon community.

The Ute Chiefs, Wakara and Arapeen were amongst the Ute traders who exercised considerable control over those involved in trading within the Eastern Yanawant Territories before as well as after the signing of the 1848 Treaty of Guadalupe Higaldo. Prior to the passage of anti-slavery legislation Wakara and his warriors monitored trade along the Old Spanish Trail and imposed tolls upon travelers. "John C. Fremont remembered meeting him and his entourage in 1844 'journeying slowly towards the Spanish Trail to levy their usual tribute upon the great California caravans . . . They conducted their depredations with form and under the color of trade and toll for passing through their country'" (cited in Jones 2000:46).

Even after anti-slavery legislation had been passed, Wakara continued to exercise considerable control over slave trading in the newly established territory of Utah. One manner of catalyzing slave trade with the Mormons entailed threatening to sell the captured Indian to either Mexican or Navajo markets, in which the Mormons believed the person in captivity would be abused (Jones 2000:47). The second form of inducement involved physically abusing captured persons in front of reluctant buyers. If sales could not be elicited, some traders were known to murder captured individuals on the spot.

Though many of the earliest Mormon pioneers came from states that did not practice slavery, they frequently found themselves confronted with the dilemma of either buying the captured Indians or witnessing the traders physically abuse or kill the people before their eyes. Under such circumstances some Mormons chose to buy people "out of slavery". In these cases the individuals whom they bought became indentured servants for periods "not to exceed twenty years" (Bancroft 1890:476). Frequently the people who were bought under such pretexts were children or women. In the case of children, they were raised with the Mormon families and inculcated with the value systems and beliefs of the people with whom they lived.

Upon reaching maturity, many of these individuals were in the unique situation of knowing more than one culture, but not being fully accepted into either. As a result, the slave

trade introduced a series of social problems that had not previously existed. In addition, slavery so radically depopulated certain Southern Paiute groups that "Garland Hurt, Utah Indian agent in 1860, reported that "scarcely one-half of the Pyeed-children are permitted to grow up in the band; and, a large majority of those being males, this and other causes are tending to depopulated their bands very rapidly" (cited in Jones 2000:47).

The collective and individual responses of Mormon towards slavery signaled a process of partial accommodation to an institution that was perceived as inherently wrong and conjoined to social problems with the potential to undermine the state of Deseret. "In a message to the legislature, dated Jan. 6, 1852, Young stated 'My own feelings are, that no property can or should be recognized as existing in slaves, either Indian or African' (Bancroft 1890:476).

In addition to expressed moral objections towards slave trading, this practice posed potential threats to the safety of the members of the Mormon Church. In particular, slave trading exacerbated tensions and warring amongst different indigenous groups. This practice also resulted in the importation of guns and ammunition into the Eastern Yanawant Territories and neighboring areas. In response to these activities and perceived threats Brigham Young and other members of Deseret passed legislation that dampened some of the trading along the trails of Eastern Yanawant territories.

Both legal and illicit commerce continued to inundate the Eastern Yanawant Territories by means of the Old Spanish Trail, Escalante's Route, and Armijo's Route until the late 1840s (*Californian*, December 29, 1847 cited in Hafen and Hafen 1993:191). In addition, a newly established route used by the Anglo 49ers passing through Salt Lake City began to burgeon with travelers intent on immigrating to the west and extracting wealth from the mines of California. As a result, the people of Eastern Yanawant as well as neighboring nations were confronted with a growing population increasingly intent on using their lands for travel, material gain, or settlement. Moreover, as the populations trafficking through the newly established state of Deseret increased, Young and his fellowship encountered a series of internal and external challenges with the potential to alternately assist or undermine church leaders' efforts to establish a growth-oriented and social cohesive church-state.

Impacts of the Forty-Niners' Route

In 1848 a deluge of prospectors and immigrants began circuiting through Salt Lake City before journeying down the western side of the Wasatch Mountains and continuing on to California. As many prospectors and immigrants used wagon transportation, the northern path of the Anglo Forty Niners quickly increased. In contrast to some portions of the Old Spanish Trail which were "never (considered) suitable for wagons" (Hafen and Hafen 1993:12), this northern route was relatively well suited for heavier cargos. In 1853 Senator Benton noted, "Wagons can now travel this route to California, and have done it. In the year 1837, two families named Sloover (Slover) and Pope, with their wagons and two Mexicans, went from Taos that way" (*New York Tribune*, March 16, 1853 cited in Hafen and Hafen 1993:198).

Along with a swelling migratory population along the 49er route, a steady stream of people continued to travel through portions of the Eastern Yanawant territories along the Old

Spanish Trail, Escalante's Route and Armijo's Route through the late 1840s. This collective surge of people upon both southern and northern routes catalyzed processes that led to the destruction of natural native vegetation as well as diminished access to land, water, and subsistence resources for certain members of the Paiute Nation. Moreover, Euro-American and Mexican American material culture and disease continued to reach Southern Paitues and neighboring tribes via heavy travel along these routes. Finally, increased traffic along the 49er route led to capital gains for the Mormon Church that would later be used to colonize many regions within the Great Basin including some of the choicest areas within portions of the Eastern Yanawant Territories. As a result of the greater access and use of lands, which included portions of the Eastern Yanawant Territories, the lives of many Southern Paiute people living in areas that now comprise the GSE/NM were radically impacted.

Though the California trail was particularly active after 1848, travel along this route is generally credited to the explorer Father Garces who reportedly "discover[ed] and follow[ed] the course of the Mojave River thus making travel possible along the Old Spanish Route and the 49ers route through Salt Lake City to California [through Indian guided explorations begun in 1768] (Hafen and Hafen 1954:15).

With the mounting interest in prospecting and immigration, large groups of people began to travel upon the northern 49er Route. Hafen and Hafen (1954) report that the first train that journeyed to California by way of the southern trail from Salt Lake City started in "Kurdasville [?] Missouri River. It numbered 49 wagons, 300 men bearing arms and numerous women and children, cattle, etc. They started June 3, 1849, but did not reach Los Angeles until the January following"(Hafen and Hafen 1954:51).

A group of packers also appear to be amongst the first travelers to complete the trip from Salt Lake City to California. They reportedly passed a wagon train led by a paid guide, Jefferson Hunt. After passing this train "at Chicken Creek, Utah on October 8" they continued on to California. One of its members, Rancho del Chin, notes that th[ey] arriv[ed] on October 27-9, 1849. "These packers made fast time, enjoyed good health, but lost about thirty animals from the scarcity of water and grass "(Hafen and Hafen 1954:28).

Though travel along the Anglo 49er trail was easier than routes through the Eastern Yanawant Territories for those who journeyed by wagon, the trail nevertheless presented numerous obstacles. "There was a group called the Gruwell-Derr Company who did not want to pay a ten dollar fee for Hunt's guide services. They employed a Mexican guide and set out ahead of the main wagon train. Evidently the party endured great hardships. When their food was nearly exhausted a group of six men pushed ahead from Mountain Springs to the California settlements on foot, and returned with supplies. The Jefferson Hunt party caught up with the main body off this advance train on the Mojave River, found the members in a destitute condition, and contributed food for the starving women and children" (Hafen and Hafen 1954:30).

Growing numbers along the 49er trail created a series of obstacles as well as opportunities for the recently arrived Mormons living in the Salt Lake Valley. Though the Mormon leadership sought to cultivate degree of physical as well as ideological autonomy from

non-Mormon populations, prior to the Gold Rush of 1848 many of them lacked some of the basic material items they had come to rely upon before moving to Deseret. In response to a desire to supplement their material needs in the wake of rising traffic along the 49er route, trade centers began to sprout up within the Salt Lake settlement. Although Brigham Young expressed concern over the rapidity with which the pioneers engaged in trade with non-Mormon traders, Mormon individuals and the collective unit of the church-state were nonetheless able to accrue the economic means to begin engendering their missionizing and colonizing goals. One result of this new found financial solvency was the capacity to promote colonization within the traditional lands of Southern Paiutes living in the Eastern Yanawant Territories.

Though the Mormons took advantage of the trading opportunities afforded by the Gold Rush, the great majority was encouraged to stay in the state of Deseret, rather than striking out to California to test their luck in the mines. Brigham Young was known to tell converts who considered striking out for gold "We are gathered here not to scatter around and go off to the mines, or any other place but to build up the Kingdom of God" (cited in Arrington 1958:65).

Rather than encouraging pioneers to join the Gold Rush activities in California, church leadership concentrated its energy on developing trading opportunities resulting from the influx of travelers flowing into the Salt Lake Valley. This increase in trade occurred at a time when the Mormon population was fairly isolated from contact and exchanges with some of the more affluent cities in the east. Prior to the rapid increase in Gold Rush Traffic through Salt Lake City, many pioneers were "living on roots, work cattle, and a small ration of cracked grain" (Arrington 1958:67).

Due to a lack of material supplies, many items including clothing, wagon wheels, and tools could not be re placed once they wore out. One pioneer who had experienced these deprivations referre to the increased trade of 1849 as a 'miracle'.

> "Information of the great discovery of gold in California had reached the States and large companies were formed for the purpose of supplying the gold diggers with food and clothing, and implements of every kind . . .These companies expected a most tremendous profit on their goods, (and) spared no expense . . .these persons procured just the things they would have done, had they been forming companies purposely for relieving the saints" (*Frontier Guardian* January 9, 1850 cited in Arrington 1954:67).

In addition, as the prospectors prepared for the last leg of their journey, they frequently lightened their loads in Salt Lake City. As a result, wagons were regularly exchanged for packhorses and mules. Other items including tools and clothing were also frequently traded or abandoned along the trail.

Through moneys accrued in a large degree via trading with people along the 49er route in the Salt Lake City Valley, the church leadership was able to finance programs which would later assist them in their colonizing programs in many regions including the Eastern Yanawant Territories. In addition to capital accrued from trading within Salt Lake City, the Mormon Battalion members frequently stayed in California to prospect before returning to Salt Lake City and neighboring settlements. Arrington (1958:66) estimates that "the earning of Mormons in

California which were contributed to the church in the form of gold dust or coin probably amounted to more that $60,000 during the period of 1848 –1851. Moreover, he maintains that private individuals probably donated an equal amount of money to the state of Deseret.

With profits secured in Gold Rush related activities, the Mormons created a perpetual immigration program and a church investment program. The immigration program provided financial aid to facilitate the relocation of American and European Mormon converts. This fund provided varying levels of assistance that allowed church members to travel into the new state of Deseret and further develop the expansionary intentions of the church leadership. Arrington (1958:79) reveals that in 1851 2,500 converts were relocated to Salt Lake City through the perpetual immigration fund, and in 1852, "some twenty-one companies, averaging over sixty wagons to the company, migrated into the Great Basin."

The Mormon establishment recruited particularly heavily from the Scandinavian countries, England, Scotland, and Ireland. Many of the converts from overseas represented some of the poorest people of Northern Europe. Amongst the new converts, a number brought diseases against which the indigenous people of the Great Basin had no immunity. Those church members who were infected but managed to survive all the way to Salt Lake City presented a considerable risk to indigenous populations both within and beyond the Salt Lake Valley.

As permanent immigration as well as Gold Rush immigration between 1848-1851 ensured a massive migration through Salt Lake City, the confluence of a diseased population with a highly mobile population increased the chance of dispersing disease over vast territories within a short period of time. As late as 1855-1856 one hundred and thirty five people within one party, and sixty-seven people within another died enroute to the Great Basin. Moreover, "Only heroic action by the volunteer rescue parties saved the remainder" (Arrington 1958:158).

Young and his priesthood used the newly arrived church members to systematically colonize areas outside of the Great Salt Lake Valley. Upon arriving into the Salt Lake Valley pioneers were frequently asked to participate in a second leg of the expansionist program made possible in part through funds accrued through trade with gold seekers along the Anglo 49er route. This program entailed colonizing new regions that were considered adventitious in manifesting the desire to populate the entire Great Basin with members of the Mormon Church.

The Mormon settlement patterns, which would later dramatically impact the lives of certain Southern Paiutes living in the Eastern Yanawant Territories, underwent two phases of development between 1847 and 1857 (Arrington 1958:84). In the first phase of settlement, colonies were established outside of the regions encompassing Eastern Yanawant Territories. Collectively, these settlements became known as the "Mormon Corridor". In 1849 some of these sites were established in the "Utah, Tooele, and Sanpete valleys; Box Elder, Pahvant, Juab, and Parowan valleys in 1851; and Cache Valley in 1857" (Arrington 1958:84). In a second phase settlements were established in more distant places that were valued as "strategic points of interception". Such settlements included: Carson Valley, Nevada (1849-51); San Bernadino, California (1851); Las Vegas, Nevada (1855); Moab, Utah (1855); Fort Supply and Fort Bridger, Wyoming (1853 and 1856); and Lemhi, Idaho (1855) (Arrington 1958:84).

which they drive back across the desert. . . This caravan had left had left *Pueblo de los Angeles* some time before us, and were consequently several days in advance of our party upon the trail- a circumstance that did us great injury, as their large *caballada* (containing nearly a thousand head) ate up or destroyed the grass and consumed the water at the few camping grounds upon the route" (cited in Hafen and Hafen 1993:192).

After 1848, much of the trade along southern trails diminished. This was in part due to the viability of wagon travel along the 49er route. The imposition of trade duties upon those who traveled via the Old Spanish Trail also served to curtail travel via this connection. Though duties were lifted with the signing of the Treaty of Guadalupe Higaldo, many travelers had already begun using alternate routes of travel in larger numbers and with greater frequency.

Through the development of trade along the Anglo 49er Trail, the stage was set for the colonization of the Eastern Yanawant over the next several decades. With a growing Mormon population, increased economic means, and experience in systematic colonization, the Mormon Church turned with renewed interest towards the prospect of expanding their colonizing efforts within the southern portions of the Utah territory, which included the land of Eastern Yanawant. Arrington (1958:216) also credits, "The self sufficiency program which followed the Utah War and the outbreak of the Civil War in 1861 [with] le[a]d[ing] Mormons leaders to greatly expand the southern colonies."

1860s-1900s Anglo Colonization of the Eastern Yanawant Territories

The extraordinary changes resulting from the rapid colonization of the Eastern Yanawant Territories are difficult to overstate. Whereas 18th and 19th Century Spanish and Mexican activities within portions of the Eastern Yanawant Territories were frequently driven by individual commercial interests intent on the transitory use of trails or resources, Anglo activities within the same regions centered on the establishment of permanent agricultural and livestock raising settlements. Gregory (1945:29) notes that "Utah was systematically colonized as self-sufficient villages and the history of the state is concerned chiefly with the growth of the original settlements". Concomitant with the process of Anglo colonization, certain Southern Paiutes permanently lost access to their lands, perennial springs, and both the natural vegetation and animals through which they had previously sustained traditional ways of life (See Kelly 1971 in Chapter 3 of the current report for a fuller treatment of the ethnography and ethnohistory of Eastern Yanawant Southern Paiute of the GSE/NM).

The colonization Eastern Yanawant Territories developed through large-scale systematic migrations of Mormon pioneers into territories already owned and fully utilized by certain Eastern Yanawant Paiutes of the Paiute Nation. Upon initiating the development of Anglo settlements in the southern portions of Deseret, "It took . . . (them) only fifteen years to found colonies at most of the best agricultural sites in Paiute country" (Holt 1992:25).

The Eastern Yanawant Territories were amongst the last regions within Deseret to be systematically colonized by members of the Mormon Church. However, while the colonization of the Eastern Yanawant Territories followed other regions, the people of the Eastern Yanawant

Territories nonetheless experienced significant changes in relation to the colonization of the Western Yanawant Territories as well as the Northern Ute Territories.

"By 1864, Mormons were located in at least four ranching and farming communities: Short Creek, Pipe Springs, Mocassin and Kanab. [Upon arriving to these places the new settlers] assum[ed] the control over the best resources for their own uses" (McPherson 1988:6). As the Western Yanawant regions as well as portions of the Eastern Yanawant regions came under Anglo dominion, many Southern Paiutes were forced into shantytowns at the edge of Anglo settlements. These indigenous settlements "form[ed] a protective ring and early warning system to aid the Mormons against Navajo and Ute depredations" (McPherson 1988:6).

Within these enclaves, tuberculosis rapidly spread amongst its inhabitants. Holt (1992:102) reports that tuberculosis "was a continuing problem . . . caus[ing] . . . about one-third of recorded Paiute deaths between 1889 and 1926". In addition Stoffle, Jones, and Dobyns (1995:192) note that tuberculosis epidemics swept through the Southern Paiute Nation in 1850, 1852, 1853, 1855, and 1856. It is quite plausible that some of the Western Yanawant Southern Paiutes who attempted to relocate themselves in lands already occupied by Southern Paiutes within the Eastern Yanawant Territories may have carried tuberculosis as well as other diseases with them. McPherson (1988:7) observes that, "by the 1860s Paiutes were being squeezed out of their territory in southwestern Utah and into the less hospitable territory of southeastern Utah and northern Arizona".

Diasporas fleeing into the Eastern Yanawant Territories to secure refuge faced the dilemma of entering into lands that were already owned and occupied by the Kaibab, Kaparowits, and San Juan Southern Paitues. In addition, these regions were renowned for their rugged physical terrain, limited water resources, and marked variability in the availability of rainfall (Webb et al 1991:22-3), as well as both plant and animal life. As a result, the human carrying capacity of regions within the Eastern Yanawant Territories provided little leverage for the long-term sustenance of larger populations.

In addition to the influx of indigenous people who had lost access to their ancestral homes, the Anglo occupation of portions of Southern Paiute and Ute territories altered the means by which certain indigenous groups could procure a living. As access to the natural vegetation, water, and animal resources diminished, pressure to find other methods of sustaining an existence resulted. Some indigenous people responded to these stresses by participating in commercial trading as well as fighting and raiding against Anglo colonizers (McPherson 1988:54 and Bradley 1999:66). Other responses to these encroachments included forming alliances with members of the Anglo population or moving into increasingly marginal lands.

Certain Southern Paiutes adopted another response to loss of ancestral lands and Anglo encroachment. This entailed intermarrying with neighboring tribes as well as forming social and political alliances with members of these groups. "By the late 1850s, the Paiutes' role among the Navajos increased, though still handled on an individual or family level, as both groups felt continuing pressure from white encroachment. Many Paiutes adopted the Navaho language, style of dress, and the practice of intermarriage" (McPherson 1988:11).

With the promise of an ever enlargening Anglo population and ever diminishing access to ancestral lands and resources, conflicts, factionalizing, war, and the radical reconfiguration of power relations amongst both Euroamerican, Mexican American, and indigenous groups occurred as a matter of course. In addition to an influx of disenfranchised Southern Paiute, Ute, and Navajo neighbors as well as the forced migration of indigenous groups within the Eastern Yanawant Territories, Southern Paiutes of the Eastern Yanawant Territories had to contend with the Anglo colonization of lands they had occupied for thousands of years. Though the first efforts towards the colonization of southern portions of the territory of Utah began in 1854, the process of systematically colonizing the most habitable regions of the Eastern Yanawant Territories occurred primarily between the 1860s and 1880s.

In order to secure land and resources in southern portions of the Utah territory the leaders of Deseret sent groups rather than individuals to develop fully functioning communities (Gregory 1945:30). They also sought to establish political alliances aimed at securing the cooperation of members of the Eastern Yanawant Territories near the newly established Mormon settlements (Bradley 1999:42). A related policy in the state of Deseret entailed diminishing conflict with neighboring tribes through mediation, conversion, and the employment of certain Southern Paiutes to fight against both indigenous and non-indigenous groups who posed physical or material threats to the Mormon pioneers. During the late 1850s "The Mormons in southwestern Utah became increasingly concerned with the advance of Albert Sidney Johnston's army, the events connected with the Mountain Meadow massacre, and the instability created by Ute raids . . . [Consequently] they desired to form an Indian alliance to shield them from possible harm" (McPherson 1988:11).

Both prior to and during the colonization of the Eastern Yanawant Territories, federal and Deseret parties gathered much information upon the geology, geography, and people of the Eastern Yanawant and neighboring territories. The US Army Corps of Topographical Engineers surveyed much of the territory from the mouth of the Colorado through the Grand Canyon. In 1861 the Ive's *Report Upon the Colorado River of the West* produced detailed and concise information upon regions that Mormons would later colonize. In addition members of expeditions organized by leaders of Deseret were sent out to survey and report upon multiple sites within the Eastern Yanawant Territories.

After establishing a mission in Harmony in 1854, scouting parties of Deseret began to gather extensive data upon regions over which they intended to secure control. From this outpost, Jacob Hamblin conducted a series of explorations into the Eastern Yanawant Territories. Moreover, in an attempt to find the trails through which Navajos crossed the Colorado to either raid or fight with Utes, Paiutes, and Mormons, Andrus "led a military expedition (in 1866) of some 60 men from St. George to Kanab and Johnson Canyons across the upper tributaries of the Paria, past the Table Cliffs, and on into the valley of the Escalante River (Gregory 1951:4). In addition, Hamblin served as a guide for John Wesely Powell's expedition whose base camp was established in Kanab in 1871. During this expedition Hamblin also accompanied the Powell expedition to the Paria River. (Powell 1994:179 cited in Bradley 1999:40; Powell 1875 cited in Bradley 1999:43-45).

Through such expeditions the leadership of Deseret obtained comprehensive information upon the Eastern Yanawant Territories that would later be utilized in settlement planning as well as in the creation of policies to regulate the interactions of Mormons with Southern Paiutes, Utes, and Navajos. After extensive research had been conducted, the systematic colonization of the Eastern Yanawant Territories began. Potential settlements were selected for their perceived capacity to sustain compact agricultural communities wherein group settlements could foster "social, educational and economic advantages usually only possible in urban centers" (Gregory 1945:30).

With the exceptions of Levi Savage and Don Carlos Shirts, most settlements in Southern Utah were collectively colonized. Levi Savage reportedly lived as the sole Anglo settler in Kanab for two years and Shirts lived as the sole Anglo resident in the Paria Valley for three years (Gregory 1945:30). In addition to the economic advantages of collective settlements, group colonization was believed to afford a measure of protection from the indigenous people upon whose lands the Mormons settled. Between the 1860s and 1870s, Mormon pioneers developed settlements that emphasized militaristic preparedness. "At each site the first structure was a 'fort' . . . large enough to accommodate the entire population in times of siege" (Gregory 1945:30). The militaristic preparation of these colonizes led later historians to describe "Southern Utah in the decade of 1860-1870 . . . as a "string of stockades and forts" (Gregory 1945:30).

In the spring of 1864 Mormons began to colonize the Eastern Yanawant Territories. They established their first settlement at the site of Kanab, wherein they intended to raise livestock and establish a flourishing agricultural community. As Kanab was already occupied by certain groups of Southern Paiutes, competition over limited resources readily ensued. As a consequence of raiding and warring with certain Navajos and Paiutes, the Mormons abandoned the settlement of Kanab in 1866 (Bradley 1999:66). However, in 1870 new settlers arrived to Kanab from Salt Lake and competition over resources resumed. As a consequence, the Kaibab Southern Paitues incrementally lost access to their lands and their resources. Many Southern Paiutes subsequently moved into the most marginal portions of their traditional lands wherein they experienced rising stresses due to a lack of sufficient resources to sustain themselves. After 1874 the Anglo settlers also began using regions outside of Kanab for sheep and cattle grazing (Webb et al 1991:27). These lands included HouseRock (Ousuk) Valley, Kaibab, and the Uinkaret Plateaus (Gregory 1945:47).

Anglo settlers used HouseRock (Ousuk) for several purposes. Located in a canyon near Cockscomb, HouseRock was colonized in 1865 by a lone Anglo gold prospector, Don Carlos Shirts. Shirts abandoned this settlement the following year in response to war parties organized by Navajos and other indigenous parties intent on maintaining control over this region. At the end of the BlackHawk Wars, HouseRock was reportedly resettled by six Anglo families, and subsequently became an outpost of the Indian Mission. In addition, HouseRock served as a cattle-grazing territory for operations based out of Kanab.

During 1865, Mormon settlers also colonized a second site at Grahm, which was located between the latter settlements of Orderville and Alton. Grahm always remained a small settlement, and Anglo population figures ranged between 14-30 between the 1860s and 1890s,

and between 8 and 12 between 1930 and 1940. From 1874 to 1912 this community also reportedly served as a ranch post office (Gregory 1945:42-44).

In 1873 another Anglo colony was established below HouseRock at the site of Adairville. This settlement, which is located 9.4 miles southeast of Paria, was first established in 1872. For two years Adairville was intensively farmed. However, the settlements of HouseRock and Adairville were both largely abandoned in 1874 after "trouble with ditches" convinced many of the settlers to relocate at Paria (Gregory 1945:51).

The Anglo population at Paria (Elk Water) grew rapidly. "By 1884 the population included 107 resident members of the Mormon Church . . . (additional) non resident cattlemen, and about 20 Piute men and women who worked intermittently for half rations" (Gregory 1945:51). Those Southern Paiutes who remained near Paria found themselves in circumstances similar to Southern Paiutes at other primary indigenous settlements throughout the Eastern Yanawant Territories. Although they no longer controlled their lands nor access to resources, they had relatively few relocation options as the territories beyond the traditional settlements offered little in the way of procuring the necessary materials for sustaining themselves. As a result, many of the Southern Paiutes in the Eastern Yanawant Territories found themselves increasingly dependent upon the foreigners who had come to dominate their lands.

Between 1883-88 and 1912 the residents of Paria experienced a series of floods that washed away fields, corrals, barns and homes (Carr 1972). In response, many farmers and miners left this settlement, with a large number relocating in Cannonville and Henrieville.

Subsequent Anglo settlements were established at many of th traditional sites that certain Southern Paiutes of the Eastern Yanawant Territories had own.d and occupied for thousands of years. These include Skutumpah (1870), Johnson (1871), the Upper Kanab (1872), Orderville (1875), Cannonville (1877), Henrieville (1877), Tropic (1891), and Alton (1908) (Gregory 1945:38).

People were particularly attracted to Skumtupah Creek and Johnson Valley as regions for raising stock. The grazing grounds were reportedly "excellent and small plots of well-watered bottomlands provided favorable home sites" (Gregory 1945:47). In addition, there were "numerous springs" throughout the Johnson Valley (Carr 1972). The Anglo population of Skutumpah maintained itself between 35-42 people between 1870-1880. After 1890, this population continued to fall, and only 5 Anglo people were recorded as living at this site by 1940. The rapid decline in population was in large part in response to the diminishment of creek waters between 1879 and 1880 (Carr 1972:128).

In 1880 there were reportedly 87 Anglos residing in Johnson Valley. This population rose to 104 in 1890, and dropped down to between 62-64 people between 1900-1910 as both "water and grass became increasingly scarce" (Carr 1972:128). Gregory (1945:47-48) also reports that by the early 1900s, "Johnson creek and its tributaries began to cut deep into their alluvial floors, destroying fields and greatly increasing the difficulty of maintaining irrigation ditches." By 1920 only 12 Anglo people were reported to still occupy Johnson Valley (Gregory 1945:42).

Between 1870 and 1900 Anglo residents also continuously occupied the Upper Kanab. Over this duration the average Anglo population consisted of 102 people. However, by 1910 these residents had abandoned this settlement. In contrast, a large and continuous Anglo population maintained itself in Orderville between 1875 and 1940. Rather than choosing to colonize Orderville based upon a careful evaluation of the quality of the land and resources, the citizens of this colony chose this site primarily as a means of exercising particular ideological principles. In 1880, 514 Anglo residents were recorded to live in Orderville. Subsequent populations ranged from a low of 378 in 1920 to a high of 441 in 1940.

In the neighboring settlement of Cannonville the Anglo population continued to rise from 137 people to 242 between the early 1880s and 1890s. During a drought year some of the residents of Cannonville moved to Henrieville Wash and Henrieville Creek northeast of Clifton. The town was later named after James Henrie who was the president of the Panguitch LDS Stake. Though this town was not officially surveyed until 1883, people were building homes by 1878. The Anglo population of Henrieville reportedly rose from 33 people in 1882 to 145 people in 1890. Gradual population growth continued, and the population stood at 240 by 1940. Likewise, population growth continued in Tropic, and was noted to rise from 194 in 1894 to 514 in 1940 (Gregory 1945:42).

Upon moving into the Eastern Yanawant Territories, many Mormon pioneers imagined they were embarking on a mission wherein they would turn the southern portions of the Utah territory into an "agricultural empire" (Gregory 1945:32). However, in spite of thorough planning and intensive labor the new settlers encountered many unforeseen obstacles.

In addition to contentions arising over the colonization of lands that were already fully occupied by certain Eastern Yanawant Southern Paiutes, changes in the physical ecology of these territories created additional problems for the new immigrants as well as for the indigenous people of these territories. Extensive erosion cutting deep into the alluvial plains, alternate phases of droughts and severe flooding, and the depletion of much of the natural vegetation occurred in and around many of the newly colonized settlements. Though studies of the "alluvial stratigraphy in the arroyo walls indicated that previous episodes of erosion had occurred under conditions that did not include livestock grazing and large manipulation of channels and flood plains" (Byran 1925 cited in Webb et al 1991:3), land use practices which included the rerouting of water for irrigation, the intensive farming of certain portions of land, and the heavy grazing of both sheep and cattle nonetheless exacerbated conditions that resulted in the radical alteration of the alluvial plains throughout many portions of the Eastern Yanawant Territories.

Webb, Smith and McCord (1991) present a thorough analysis of environmental changes of the alluvial plains along the Kanab and Johnson Creeks in *Historic Channel Change of Kanab Creek*. Citing evidence gathered from tree ring studies, Webb et al. (1991:20), note that "the historical record indicates that the arroyo of Kanab Creek was initiated during a series of floods beginning in 1882". Floods occurring over a period of 50 years also "initiated (the development) of other arroyos in Southern Utah" (Webb 1987 cited in Webb et. al 1991:20). Furthermore, Webb et al (1991) note that scar clusters upon tree samples between 1866 and 1916 indicate that the series of floods within this region did not occur randomly. "In the case of Kanab Creek, the

increased flood magnitude between 1882 and 1936 that is unprecedented in the over-500 year record" (Webb et al 1991:24).

The dramatic changes in channelization and natural vegetation within the Eastern Yanawant Territores resulted in conditions that posed serious consequences for both indigenous and non-indigenous populations. With an influx of both Anglo settlers and indigenous populations displaced from their traditional lands in the Western Yanawant Territories as well as neighboring lands, competition over natural resources increased. Initially, many Southern Paiutes moved towards the more marginal lands within the Eastern Yanawant Territories in order to increase their chances of survival. However, the rapid population growth experienced in the Eastern Yanawant Territories as a result of both Anglo immigration and the exudus of many neighboring indigenous groups coupled with increased flooding, erosion, channelization, and the depletion of natural vegetation made the procurement of the most basic resources increasingly difficult. By 1880, interconnected layers of ecological and human processes had radically altered the lives of many Southern Paitues living in the Eastern Yanawant Territories.

> "Jacob Hamblin, on of the men most responsible for the success of the Mormon colonizing efforts in southern Utah, wrote to J. W. Powell, in 1880, that, "The watering places are all occupide {sic} by the white man. The grass that product mutch {sic} seed is all et {sic} out. The sunflowere seed is all distroyed {sic} in fact thar {sic} is nothing for them to depend upon but beg or starve (Fowler and Fowler 1971:110 cited in Holt 1992:35)

Once the natural vegetation was disturbed, the results were often long lasting. Gregory (1945:33) notes that "In this semiarid region the natural herbage is scanty and when destroyed reproduces itseh with seemingly difficulty".

1880s- Restoration

In response to the loss of resources necessary to maintain even the most elemental of existences, many Southern Paiutes of the Eastern Yanawant Territories increasingly turned towards the Anglo settlers for assistance. While some Southern Paiutes were able to procure menial labor in exchange for food and others received intermittent donations of food and clothing, such partial provisions could not satiate the collective needs resulting from the radical alteration of the landscape as well as the depletion and loss of access to traditional resources.

As a growing diaspora of Southern Paiutes throughout both the Eastern and Western Yanawant Territories placed increasing demands upon the Anglo settlements, Mormon leaders attempted to create policies that would simultaneously curtail open aggression between themselves and indigenous groups without fundamentally altering resource distribution. The now famous phase of Brigham Young stating "Feed the Indians, for it is cheaper to feed them than to fight them" (cited in Palmer 1933) encapsulates this idea. While this policy may have succeeded in diminishing open aggression between Mormons, Southern Paiutes, Utes, and Navajos, it also served to cultivate an ideology of paternalism between the Mormon settlers and the people who had lived in the Yanawant Territories for thousands of years (Holt 1992: xiv).

Paternalism towards indigenous people was further catalyzed through Mormon theology, wherein American Indians were viewed as "Lamanites" or one of the lost tribes of Israel whom the Mormons had a direct investment in saving (Holt 1992:22). Paternalism also underscored a series of federal and regional policies that largely resulted in the further alienation of the Southern Paiutes of the Eastern Yanawant Territories from their lands as well as their traditions.

Since 1865 many of the federal and regional policies enacted in relation to the Southern Paiutes of the Eastern Yanawant Territories have magnified the material and cultural hardships of these groups. With the establishment of the Unitah Reservation in northern Utah in 1865, all Southern Paiutes were directed to abandon their ancestral lands and relocate amongst the Utes with whom the Southern Paiutes had a long history of contention. In meetings conducted by a special commission led by Powell and Ingalls in 1873, Southern Paiute leaders Taugu and Moak Shinauav rejected this proposal. They explained that, "The Utes of Unitah had been their enemies from time immemorial; had stolen their women and children; had killed their grandfathers, their fathers, their brothers and sons, and . . . were profoundly skilled in sorcery" (Intertribal Council of Nevada 1976:95). In the absence of congressional ratification, this forced migration of Southern Paiutes did not occur.

In 1871, Southern Paiutes received another blow to their autonomy through the passage of the Indian Appropriation Act, which officially ended the establishment of treaties between the US government and indigenous groups. In addition to halting the creation of treaties, this act signaled the end of the US government's recognition of the equal sovereignty of Indian nations.

In the absence of land bases or treaties to compensate for these losses, the plight of the Southern Paiutes of the Yanawant Territories worsened. In 1873 a special commission was developed to address these issues. The leaders of this commission, John Wesley Powell and G.W. Engalls, recommended a second design for the relocation of the Southern Paiutes. According to this plan, the 528 Southern Paiutes whom they had counted in the Eastern and Western Yanawant Territories would be moved to the Muddy or Moapa Reservations in Nevada (Intertribal Council of Nevada 1976:95). One of the primary reasons for trying to relocate the Southern Paiutes of the Yanawant Territories into Nevada was a growing recognition of the severe crises resulting amongst the Southern Paiutes due to "the depletion of traditional food sources" (Holt 1992:34). A second and equally powerful motive behind attempting to remove the Southern Paiutes from the Yanawant Territories entailed opening up additional tracts of land for Anglo settlement, agriculture, prospecting, and the grazing of livestock (Holt 1992:34).

Between the 1880s and 1890s the Anglos' efforts to establish control over both the Western and Eastern Yanawant Territories resulted in more unofficial migrations into the marginal zones of the Eastern Yanawant Territories as well as the Arizona Strip. In addition, many Southern Paiutes became increasingly dependent upon Anglo settlements wherein they might procure menial labor or temporary supplies of food (Intertribal Council of Nevada 1975:95). Those Southern Paiutes who remained near Anglo settlements were primary targets of the assimilationist philosophies being promulgated at this time. A statement made by Robert Gardner in 1879 reflects this perspective:

> "You Indians want a heap of land and have no teams nor plows, nor tools to work with; nor seeds to plant. You want us Mormons to do all this for you. We have no time. We must work for our own children. *You must do as we do-* take a little land, do a heap of work, and raise more grain. Now Moqueak, what I say I mean, and *you need not trouble me anymore, for more land. I know better what is good for you than you do for yourself*" (Gardner 1879).

While some Southern Paiutes living in the Eastern Yanawant Territories were given intermittent aid from the Mormons, "during the early 1900s, the Paiutes were virtually ignored by the federal government" (Holt 1992:35). Yet, at the same time that the federal government was seeking to progressively distance itself from Indian affairs through the deconstruction of reservations and the establishment of land allotments (Holt 1992:40), the BIA of Utah was finally "getting into the reservation business".

Between 1881 and 1929 four small reservations were established in Utah at Shivwits (1891), Indian Peaks (1915), Koosharem (1928), and Kanosh (1929) (Holt 1992:40-44). In addition, the Kaibab Reservation was established in Northern Arizona on May 28, 1909. Though some Southern Paiutes relocated to reservations, the lack of sufficient resources in these places also served as a deterrent. As a result, some reservations were used by only a small percentage of the population, and/or occupied on a seasonal basis. One group of Southern Paiutes remained in the ghettos of Cedar City. Within these ghettos the Southern Pauites experienced pervasive poverty as well as diseases including tuberculosis (Holt 1992:48).

During the early 1900s, many of the Southern Paiutes of the Eastern Yanawant Territories continued to eke out existences along the margins of Anglo settlements. However, their numbers progressively dwindled as a result of extreme malnutrition and disease. In 1910 a Southern Paiute Chief in Escalante reproached Anglos in a dance hall saying:

> "My friends it is right for white m[e]n to have [a] celebration, to talk about [the] land- [the] white man['s] land-[the] white man['s] flag-[the] big United States. [On] white m[e]n['s] money- [the] dollar- has an eagle on one side . . . Today I f[ou]nd a[n] eagle, [that a] white boy [had] shot. . . [It's] dead now . . . [The] Indian[s] shoot [a] little bit. [But] the white man shoot[s] too much. [Now the] eagle[s] [are] all gone . . . Pretty soon, [the] Indian[s] [will all be] gone. [At] one time [there were] many Indian[s] [and] many papoose[s]. [Now] the Indian[s] die [and the] Papoose[s] die. [We] sleep in a cave . . . [and we have only a] little bit [of] food. [At] one time [there were many] rabbit . . . fish . . . [and] deer. [Now there is only a] little bit. [The] white man give[s] [the] Indian[s] bread. [The] Indian[s] beg [and the] squaw beg[s] "Give [us] bread". [But it] is no good. [The] Indian[s] [do] no[t] like [to] beg. . . [I am an] Indian chief. . . [But] Now [I am] no [longer a] chief. [It's] no good! No good! [The] papooses die too much. [The] eagle[s] [are] all gone. Pretty soon [the] Indian[s] [will] all [be] gone" (Woolsey 1964:384 cited in Holt 1992:50)

Over the next several decades, federal policy did little to relieve the material impoverishment resulting from the progressive marginalization of the Southern Paiutes from their land bases in the Eastern Yanawant Territories. In 1930, Farrow, acting as the

administrator of the Paiute Agency in Cedar City explained that "Indians allied with no tribe and having no trust property could not partake of the benefits of appropriations made for the support and civilization of Indians" (Farrow 1930:1-2 cited in Holt 1992:52).

As a result of this policy, Eastern Yanawant Southern Paiutes who did not assimilate into groups who were officially recognized by the federal government received no assistance. While some Paiutes from the Eastern Yanawants intermarried with Navajos and other tribes along the Colorado River, and others may have received assistance through the Kaibab Reservation in Northern Arizona, it is probable that a sizable portion of the Eastern Yanawant Southern Paiutes failed to meet the criterion for federal recognition. Moreover, as the Southern Paiute population of the Eastern Yanawant Territories continued to fall as a result of disease and malnutrition, it is probable that outside agencies found it increasingly difficult to identify the remaining Southern Paiutes as members of discrete districts to whom they held particular responsibilities. Finally, even those Utah Indians who did receive federal recognition received "extremely limited (services from the BIA) in 1930" (Holt 1992:53).

The publication of the Meriam Report in 1928 revealed many inadequacies within the federal government's policies towards Indian groups. In particular, Lewis Meriam recommended the repeal of the Dawes Act of 1887. In lieu of land allotments, Meriam and his associates recommended educationally based policies (Holt 1992:54). In addition this report laid the grounds for the Indian Reorganization Act, which resulted in significant reforms aimed at protecting Indian land rights and increasing the self-government of tribes.

During the Depression some Southern Paiutes were able to work on federal projects and thus maintain a regular source of income. In addition, the Mormon Church provided a degree of relief through the organization of an arts and crafts business (Palmer 1936a in Holt 1992:55). However, while the material well being of the Southern Paiutes was partially improved by these measures, an outbreak of scarlet fever in Kanab in 1931 created additional stresses upon both the Southern Paiute and Mormon populations (Bradley 1999:206).

Under the leadership of John Collier, the Indian Reoganization Act repealed the Dawes Act, and made provisions for the self-governance of tribes and the maintenance of tribal lands. However, amongst the Southern Paiutes of Utah only the Kanash and Shivwits groups accepted the tenants of the Indian Reorganization Act (Holt 1992:58). As a result, the full impacts of reform were only partially instituted amongst the indigenous people of Utah. In addition, as many of the Southern Paiutes of the Eastern Yanawant Territories lacked federal recognition, they were not directly affected by these reforms.

After WWII, the pendulum on Federal Indian Policy swung towards the termination of the trust status between Indian tribes and the federal government. In addition, Indians were to be relocated to urban centers, a claims commission would be created to liquidate all Indian land claims, and the BIA would be progressively eliminated (Holt 1992:61-2). In Utah Senator Walkins spearheaded legislation aimed at the termination of federal responsibilities towards indigenous groups. As a result, the Southern Paiutes of Utah were amongst the first tribes within the United States to be placed on the list for termination.

Though the Southern Paiutes represented some of the most impoverished indigenous people in North America, legislation aimed at the termination of their special trust relationship with the federal government was quickly passed. By 1954 President Eisenhower had signed a bill to terminate the Utah Southern Paiutes' trust relationship with the federal government (Inter-Tribal Council of Nevada 1976:145). Shortly thereafter, a final date of termination was set for February 21, 1957 (Holt 1992:82). As a result of this legislation, the Southern Paiutes of Utah lost additional land, federal services, and the garden and farming enterprises that had previously guaranteed them a measure of autonomy and self-sufficiency (Holt 1992:87).

After the termination of the Southern Paiutes of Utah had been effected in 1957, the indigenous people of the Eastern and Western Yanawant Territories were faced with a new series of obstacles. In addition to the loss of lands through taxation, they were seriously impacted by diminished access to health care, training, and legal protection (Holt 1992:98) The Southern Paiutes of the Yanawant Territories also faced health problems ranging from extreme malnutrition amongst infants to tuberculosis and obesity. Both sanitation and sewage problems also exacerbated health problems amongst these groups (Holt 1992:102). In addition, a lack of sufficient educational opportunities made it difficult for many Southern Paiutes to establish economic independence. As a result of insufficient training, many of the job opportunities afforded to the Southern Paiutes were frequently low paying and/or seasonal in nature.

Over the next two decades, the Southern Paiutes of the Eastern Yanawant Territories received little attention from the federal government. With the exception of a program instituted by the University of Utah, whose primary purpose was to assimilate Southern Paiutes into Anglo society, the Southern Pauites received little assistance that would sustain the health, economy, or culture of these groups on a long-term basis.

Since the 1970s, federal policy directed towards the restoration and revitalization of the Southern Paiute communities has gradually begun to take effect. In 1978 Larry EchoHawk drafted legislation designed to regain federal recognition for the Southern Paiutes of Utah (Holt 1992:132). Over the following year many Southern Paiutes publicly voiced strong support for the Paiute restoration as well as the re-creation of a land base (Holt 1992:133). After extensive lobbying, "the Restoration Act, Public Law-96-227, was signed by President Carter and became law on April 3, 1980" (Holt 1992:134).

In some respects the policies underlying federal-Indian relations between 1970 and the present harken back to the Indian Reorganization Act. Support for ideas expressed by John Collier as "self tribal government" and the "protection of Indian lands" are presently expressed as "Indian self-determination" and "government-to-government relations" (Holt 1992:125). Collectively, these values have become of paramount importance in defining relations between the federal government and Southern Paiutes. However, despite a return to policies based on reformation and increased tribal autonomy, the Utah Southern Paiutes' efforts to establish a land base sometimes met with the open opposition of members from the Anglo community. In contrast, the community offered much greater support for efforts to enact the Southern Paiute Restoration, which entailed no overt changes in the resource distribution of the immediate community.

Beginning in 1981, the Southern Paiutes of Utah hired consultants from CH2H Hill and priorities were established for securing an appropriate land base for their reservation. In addition to "provid(ing) a land base", the planners emphasized generating income for the tribe and its members through job development, "management experience" and "services to the tribe". The provision of "special lands with cultural or traditional values as tribal gathering places" was also emphasized as a high priority (Holt 1992:136).

The Southern Paiutes experienced many set backs in the process of finding and acquiring a new land based. After selecting five sites that were vigorously contested by private and corporate representatives from the Anglo communities, they finally settled on a piece of BLM land one third the size allowed for in Restoration legislation, and lacking the potential for economic development through either agriculture or mining. "On February 17, 1984, President Reagan signed H.R. 2898, transferring 4,770 acres of land to be held in the trust of various Paiute bands and authorizing a trust of $2.5 million" (Holt 1992:146).

Though the restoration and acquisition of a land base signal definitive improvements for the present and future welfare of the Southern Paiutes of Utah, some of Southern Paiutes of the Yanawant Territories still experience themselves as "strangers in (their) own land" (cited in Holt 1992:127). Private individuals, stock raising corporations, and the national park service now exercise dominion over regions previously occupied by Southern Paiutes of the Eastern Yanawant Territories for thousands of years. Though access to these places varies, a high percentage of the sites upon perennial streams are now partitioned off as private property, and thus gated, locked, and inaccessible.

In the new chapter, we evaluate the ethnography and ethnohistory of these sites prior to their appropriation by private individuals and corporations. Drawing on the works of Isabell Kelly (1971) and her Southern Paiute consultants, the original occupation of these regions as well as the connections between particular Southern Paiutes and the land, perennial springs, natural vegetation, animals, and neighboring groups is elaborated in greater detail.

Chapter 3
Unpacking Kelly

Introduction

Those conducting the present study of the Grand Staircase-Escalante are in the unique position to draw upon the extensive and direct detailed ethnographic information of people and places previously represented in the writings of Isabel Kelly. Due to the wealth of information available through these writings, we center this chapter on Kelly's original texts. In order to make Kelly's observations most useful for the present study we have cross-referenced the original observations with materials that have become available since the time when Kelly's original data was assembled for publication. We supplement Kelly's data with 1) interviews conducted with contemporary Paiute people, 2) census data used to develop family linkages with the past, and 3) data collected via GIS that allows us to map relationships to and between places. Finally, we include the modern concept of cultural landscapes, as well as documents that were generally unavailable to Kelly during the time in which she wrote.

While still a graduate student in the Department of Anthropology at B\ `kley, Isabel Kelly began collecting ethnographic data upon the Southern Paiute of southern Utah, orthern Arizona, southeastern California, and southeastern Nevada. Though she gathered her orig nal ethnographic field notes in 1932, they were not assembled for publication until 1933 and 1934. In addition to writing *Southern Paiute Ethnography* (1934), Kelly published *Ethnography of the Surprise Valley Paitue* (1932) and *Southern Paiute Shamanism* (1939). In the words of Kelly, she utilized an ethnographic style that was "telegraphic" and "unabashedly of the how-was-it-in your-grandfather's day approach" (Kelly 1971:iii). Her approach reflects the predominant intellectual climate of the day, as well as the scholars with whom she studied. Given the opportunity, scholars of today might approach Kelly's work from vantages that diverge markedly from the original. However, despite changes in intellectual currents, Kelly's ethnographic data of the Southern Paiute of the Grand Staircase-Escalante provides a wealth of information regarding the existence of those who occupied a cultural landscape that extends from the present back through both historic and prehistoric periods.

We have entitled this chapter *Unpacking Kelly* because the text presented in Isabel Kelly's (1971) *Southern Paiete Ethnography* is very close to her original field notes, and thus organized more or less as she collected the information. Fortunately, she organized much of her text around a natural resource theme similar to the organization of the present report. Thus, we "unpack" Kelly's report simply by providing an exegesis of information on where people were living and what people were doing at the turn of the century, while also incorporating data from other relevant sources. In order to understand the ethnographic information set forth in Kelly's (1971) *Southern Paiete Ethnography* it is essential to note the absolute centrality of water.

appropriate way to find out the place where Paiute people "came from". You would get a much different answer to the question "Where do you live?" This is so because most Paiute people have been forced off of what they perceive is their traditional family land and they now live elsewhere.

It was one of those neat moments for a young anthropologist who asked a Paiute elder "Where is your water?" The elder smiled in reply and began telling the young anthropologist where his family lands were located. After more than twenty years and hundreds of interviews with Paiute elders the same anthropologist continued to ask, "Where is your water?" However, rather than losing its poignancy over time, the question "Where is your water?" had only begun to reveal its depth.

The Meaning and Power of Water

The cultural importance of water was further revealed through a practice of some Paiute families of gathering a bucket of water and then presenting and praying over before eating. Those prayers, usually said in Paiute, are like conversation with another person; thanking them for providing life to the family members. After the prayer, each family member may drink from a common ladle filled with the water. The ceremony is not unlike Christians thanking god for life and taking communion. Amongst the Paiutes water has never been taken casually.

In another context, Kaibab Paiute elders gathered to explain the deep significance of knowing that all things are alive. During this group meeting, these elders explained that mountains, rivers, minerals, and even small rocks are alive and have distinct personalities. Like people, some are stronger, some have special skills, and all can either be convinced to share this power or be inadvertently insulted and become angry. Children are taught that if they speak too loud while on a mountain it may cause them to lose their way. If you take a rock, crystal, or mineral without its permission it may hurt you. This, by the way, was the first Paiute cultural explanation for why radioactivity hurts humans; that is, because it is an angry rock. When Paiute children are taken to the Colorado River they are taught not to speak too loud or to throw rocks into it. Angered, it can take you away from your family. Properly talked to however, the Colorado River can give you life and health, by serving as a place of medicine and ceremony. In these observations, we see in detail the components that make up the general metaphor that was shared by the San Juan Paiute elders - the river is the blood and veins of the earth.

Through these shared insights, Paiute elders reveal an understanding of water as a living being. In particular, rivers, as well as one's proximity to rivers can be important. A medicine plant has a power to cure, but this power is greater if it is growing near to the Colorado River. A red paint is sacred, but it is somehow more sacred because it comes from next to the Colorado River. A curing rock is strong and unique, but one that lives in the middle of the Colorado River is perhaps the strongest currently known. A woman's curing ceremony can be held anywhere, but Paiute people constructed a curing house in an isolated area right next to the Colorado River, thus requiring an enormously difficult climb and lengthy travel from the nearest living area for the patient and curing ceremony participants. When attacked and defeated in other portions of their traditional lands, Paiute people moved to regions of refuge along and in side canyons of the Colorado River, which protected them. When the chaos of social and environmental change

threatened to overwhelm Indian tribes of the region, together hundreds of them danced the Ghost Dance ceremony near the Colorado River to bring on the millenarian destruction of the Europeans intruders. The large volumes of white and red paint needed by the Ghost Dancers probably came from along the Colorado River or from deposits in its side canyons. The salt and bird funeral songs, which when sung by friends and family carry Paiute people to the land of the afterlife, come from a cave in the Grand Canyon. The point of crossing to the land of the afterlife is perceived by some as being in the Grand Canyon near the Colorado River. What does it mean, then, for something to be near the Colorado River? It means everything - even life itself.

If we consider again the San Juan Paiute metaphor of the Colorado River as the veins of the earth, then we are tempted to extend this perception and to conclude that the valleys of the Colorado River are the body of the river. Valleys channel water into streams that join the Colorado River, they feed the river, they are the river. Valleys with streams that join other rivers belong to those rivers. Thus valleys that constitute the watershed of the Colorado River are, in a real sense, its' body.

The body of a river is bounded. What is inside contributes to its unique qualities, what is outside serves as contrast. Given that a watershed is one of the defining characteristics of a river, we could also use the term ecosystem to describe the body of a river. As an ecosystem, the body of the river is not totally self contained or insulated. For example, animals, birds, and people regularly move in and out of the ecosystem. Yet, even with these movements and changes, there remains something unique about each river, its associated valleys, and the things that occur within its body.

There is a more technical term for talking about a river and its body. This term is **Riverine Cultural Landscape**. This term is more descriptive of what we are discussing here because it places the emphasis on the Indian people who live, use, perceive, and attach themselves to the river and its body, but still included the biotic and abiotic features of the ecosystem.

Components of A Riverine Cultural Landscape

What is special about a Riverine Cultural Landscape? Below is a set of answers to this question. Some of these have been discussed briefly above, but we need to go into more detail if we hope to both argue for and develop a model of such places.

Water is a Source of Life.

Water is the source of life, not only as an elementary element, but also as a series of living forces, beings, which help create and sustain life.

* Water takes many forms, each with its own potentials for helping or harming humans and the plant and animals that sustain them.

Water is Associated with Spectacular Geology.

Rivers cut geologically dramatic canyons, and waterfalls electrify the air around them as well as provide spectacular views. Sunlight interacts with water to produce rainbows, which are themselves, another life form. Hot springs create multicolored environments that are both attractive and healthy for humans.

* Spectacular geology is often associated with exposed mineral deposits that include clays used for medicine, salt used for food, and hematite pigment used for ceremony.

Water Demonstrates its Power.

The Navajo people call violent summer rains "male rains" in order to indicate that they have different characteristics than the more gentle "female rains" of winter. Floods from rivers enrich some sand-based deltas associated with the river basin while destroying animals, plants, and eroding other places in the river basin. Flash floods appear where little rain has fallen and, having directly interacted with the land elsewhere, move great quantities of earth as well as water. Flooding tends to modify the landscape in ways impossible for humans to conceive, and do so beyond human control.

* Violent rain events are associated with lighting and wind, which are also powerful forces.

* Water can disappear and reappear many miles away, giving evidence of its willful nature.

Water-Canyons Serve As Regions of Refuge.

Water creates certain places that are difficult to gain access to. Deep canyons and hanging valleys are examples of such places. During the historic period Indian groups used particular regions with water for refuge. Due to European encroachment more accessible watering areas were frequently stressed by the multiple demands that growing heterogeneous populations placed on accessible waters. Geographically inaccessible areas only became regions of refuge when sufficient water was presence to sustain the lives of the Indian groups.

Water Creates Riverine Oases.

Rivers begin where there is abundant rainfall but then flows for hundreds of miles into and through arid regions. Rivers can create ribbon oases that sustain life for plants and animals that otherwise could not be in the more arid region.

* Riverine oases serve as flyways for birds and migration routes for animals moving from one ecosystem to another. There are animals that would otherwise neither be

present in more arid regions nor be so concentrated making them highly accessible to humans.

Water Influences Human Society.

Water can be both a source of social integration and separation.

* Rivers are a source of travel for humans, thus permitting frequent and rapid communication and the formation of more complex and widespread social systems.

* Rivers may serve as a natural boundary between different ethnic groups, thus rivers may be places of either interethnic competition or cooperation.

* Rivers can be located in the geographical center of societies, far removed from the outer boundaries of ethnic group territory

* The control of water can become an organizing feature of society, especially when it is used in irrigated farming.

* Human population density was higher along waterways, thus settlements there tended to be the center of human life in the region.

Other Forces' Response to Water

Water Spirits.

Spirits associated with Southern Paiute burials normally prefer to remain where they were originally placed. In southern Utah, when the impounded waters of Quail Creek Dam covered a series of Southern Paiute burials, their spirits disliked being covered with water and burrowed through the bottom of the earthen dam causing it to collapse. Before the dam broke, some of the spirits worked with the water to drown swimmers.

Water Babies.

A powerful spirit called Water Babies live in various types of water.

Large Guard Snakes.

In past times, large snakes lived with and protected water sources. When Euroamericans killed the snakes, the water became angry and disappeared.

Water Fights Fire.

Water battles fire, but fire can defeat water. An example of the latter occurance exists in the story of when rabbit burned the creosote-bush (*Larrea tridentata*) and pushed back the oceans so the sun could dry the land.

Great Creation Floods.

Water can extinguish all life in great floods, forcing life to both save itself and remake itself by moving to a new creation plane.

Developing a Policy-Relevant Model

So what does this all mean? Of what use is it? To begin with, this model should be useful for helping American Indian people convey their cultural concerns to some agency that plans to use or is using a riverine cultural landscape. Furthermore, the model should help the agency land managers focus on those aspects of the ecosystem-cultural resource interface, which can reasonably be controlled or influenced.

For example, the Indian people who are traditionally tied to a riverine ecosystem that is being used by a federal agency may believe that damming the river has caused the weather to change, thus drying the plants in the valley. Unless the agency can devise a way to eliminate the dam or to create more rain over the valley, the agency may not be able to act in a manner that fixes the problem. On the other hand, if the tribal elders can conduct prayers that will return balance to the ecosystem and the agency permits such remedial actions, then the rain issue may be resolved.

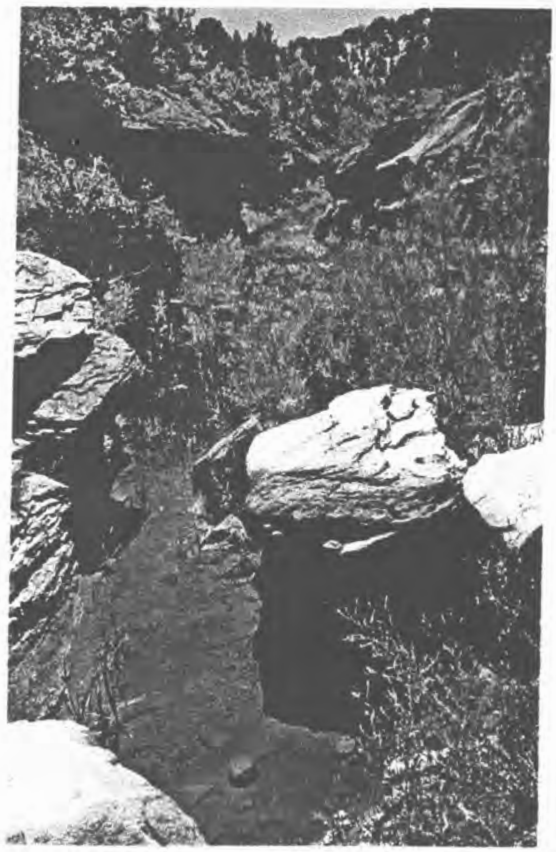
In another instance, Indian people may believe that certain places along a river are being impacted by patterns of water release from a dam. Modifying how water is released tends to be within the engineering capacity of the dam operators, however, it may be economically or politically impossible to do. In both of these cases, it is necessary to understand the Indian perspective of what is in the riverine cultural landscape and how this can be influenced by agency actions. Once this is known, the agency or the Indian people can undertake specific actions aimed at remedying the problem.

Springs of the Grand Staircase-Escalante National Monument

The inhabitants of the GSE/NM lived in a delicately balanced ecosystem. Within this environment, water, earth, plants, animals, and people engaged in constantly shifting yet carefully choreographed exchanges. The success of the Southern Paiute inhabitants rested upon a thorough knowledge of their desert home, wherein water remained a key phenomenon upon which all life hinged.

The majority of the population that previously resided in the GSE /NM lived in areas below 7000 feet where climatic conditions were less severe than conditions at higher elevations noted for heavy snowfall. The middle and lower tiers of lands are arid, with some perennial

streams. Streams located at the base of plateaus and cliffs determined the positioning of permanent settlements occupied on a seasonal basis (Kelly 1971:2). Below we list the springs and watering places identified by Kelly and her consultants, followed by a more in-depth analysis of the ethnographic materials, cultural landscape, kinship ties, and archival information relating to each site.



Springs

1. **Kanavic** [Willow; Sheep Trough Spring [?]]
2. **Togoavac** [Rattlesnake Water]
3. **Sovipac** [Cottonwood Water]
4. **Siiumpac** [Yellow, Gray [?] Water]
5. **Atankwinti** [Sand Stream; Canaan or Cottonwood Spring [?]].

6.	**Sovinokwint**	[Cottonwood Stream; Short Creek]
7.	**Muivac**	[Mosquito Water]
8.	**Paganktonic**	[Cane Knoll [?] or Cane Beds [?]; Sapir, 1930, 604-5]
9.	**Ovac**	[Salt; Alkali Water]
10.	**Mi tin-wogaip-paganti**.	
11.	**Mi tinwava**	[Point of Hill; Pipe Spring; Sapir, 1930, 570]
12.	**Pacpikaina**	[Water Bubbling Up; Moccasin Spring; Sapir, 1930, 597]
13.	**Tinkanivac**	[Cave Water; Antelope Spring, southwest of Pipe Spring]
14.	**Kacoapac**	[End of Water; 1 [?] mile north of Mocassin Spring).
15.	**Pavuavac**	[Sapir, 1930 598, Pavu a-vaac; Point Spring, 2 mi. northeast of Moccasin Spring]
16.	**Pawiavac**	[Mud Water]
17.	**Soviwinincic**	[Cottonwod Standing Up]
18.	**Uwantic**	[Rain, because water sprays off rocks; called also Patituatic, Water Sprinkling]
19.	**Anavac**	[Black-Ant Water]
20.	**Tinkanivac**	[Cave Water]
21.	**Skumpac**	[Rabbit-Brush Water; Rigg Spring]
22.	**Tonovac**	[Greasewood Water; Sapir, 1930, 598, Tono-vaac]
23.	**Samiapac, Nacimipac**	[Pebble Water; Cottonwood Spring]
24.	**Siivac**	[Squawbush Water; Sapir, 1930, 598, Sii-vaac]
25.	**Sawavac**	[Sagebrush Water]
26.	**Kanariuipi**	[Willow Canyon; Kanab Creek; Sapir, 1930, 629, Kanari-uipi]

27. **Ciakwiavac**	[Oak [var.] Spring]
28. **Oavac**	[Salt Water]
29. **Tiavac**	[Serviceberry Water; has another name, which G does not remember]
30. **Johnson Creek**	[Canyon; name not recorded]
31. **Na avac**	[Lone Spring]
32. **Muiatic**	[Said to refer to nose; a lake east of Johnson Canyon]
33. **Pagawipi**	[Cane Canyon]
34. **Ipa**	[Old Water; Navajo Well; about 1 mi. south of Vermilion Cliffs]
35. **Tupac**	[Black Water; about 3 mi. east of 34]
36. **Mu kovac**	[Rock [?] Water]
37. **Kamuwac**	[Rabbit Water]
38. **Panwiavac**	[Mud Water]
39. **Kanawaic**	[Willow Hanging Down]
40. **Kanarimpiku**	[Knoll [?]; reference apparently to willow]
41. **Tinkanivac**	[Cave Water]
42. **Ciampivac**	[Wild-Rose Water]
43. **Si ivac**	[Squawbush Water]
44. **Sovpac**	[Cottonwood Water; 16- Mile Spring [?]]
45. **Kakarimpac**	[Quail Water]
46. **Sovpac**	[Cottonwood Water]
47. **Piki-pa**	[Rotten Water]
48. **Atavac**	[Sand Water]
49. **Wigimpac**	[Vulva Spring]

70. **Paiyampagati** [Water Halfway Up Hill]

71. **Pagwuiacpikanti** [From Gambel Oak; in canyon just north of Mangum Spring]

72. **Piacampipkwitic** [Locust Stream; Mangum Spring; Sapir: Piaicapinukwint [Oak [var.] – Spring].

73. **Ankapi** [Red Spot; Big Spring; Sapir: Ankapu: Reddish]

74. **Mo onticivac** [Owl Head Water; Sapir, 1930, 598, Moontocivaac [Humming-Bird-Head Spring]; Sapir lists this between 72 and 73]

75. **Maavawiniti** [Tree in Water]

76. **Sinavac** [Coyote Water]

77. **Sagwogo acpa** [Tobacco Water]

The Southern Paiutes with whom Kelly worked with in 1932 designated the previously listed springs as central to the lives of the people who occupied the lands of the Grand Staircase-Escalante/NM traditionally, aboriginally, and historically. Kelly's Kaibab consultants included: "Captain George, Mose, Adam, and his sister, Sarah Frank. Miscellaneous information was also provided by others, particularly Minnie Tom, an elder who was born in Cedar territory to a Cedar Father and a Kabaib mother, and who lived for many years amongst the Kaibab Southern Paiutes" (Kelly197: 3). Through her work with experts detailing the traditions, ideas, and histories of the Kaibab, Kaiparowits, and San Juan, Kelly sought to develop a greater understanding of the subsistence practices and domestic economies underscoring Southern Paiute society. While the ethnographic materials gathered herein reveals information consistent with the research questions posed by Kelly, these consultants also consistently relayed a singular message suggesting that the heart of the Kaibab lifeworld is water. The centrality of water served as a foundation of traditions, settlement strategies, subsistence activities, and the knowledge bases through which the Kaibab Southern Paiute explained the phenomenal as well as the supernatural worlds. The importance of water is confirmed in the origin stories of the desert dwelling Southern Paiutes wherein Ocean Woman (Hutsipamamau ?u) and water exist in the place of beginnings.

Connections between the Southern Paiutes and the delicately balanced ecosystem of the GSE/NM have often centered upon relationships to water sources. In this chapter we have chosen to follow the lead of Kelly's consultants who used the perennial springs throughout the Grand Staircase-Escalante as a descriptive basis for explaining the lives and practices of their ancestors. The Kaibab Southern Paiutes frequently lived near springs along the Vermilion Cliffs of the Grand Staircase-Escalante. In conjunction with the resources available in the valleys and the Kaibab and Paunsaugunt Plateaus, this land provided them with all of the materials necessary to sustain life, build communities, develop botanical, medicinal, astronomical, and ceremonial knowledge, and practice cherished traditions. Most of the perennial springs along the Vermilion Cliffs served as permanent places of settlement. In addition, the early Southern Paiutes regularly

utilized particular regions for camping, social gatherings, and both food and resource procurement.

In the following accounts, we describe the springs identified by Kelly's consultants, the permanent settlements that arose in these places, and the kinship structures of its occupants. In addition, we present cultural landscapes detailing webs of connection amongst the people, places, plants, and animals whose lives constantly created new fabrics of interchange as a result of their reliance upon these life-giving waters. Finally, we provide ethnographic information and descriptions from archival research that shed further light upon the ways in which particular springs were used in the lives of the Kaibab Southern Paiutes of the Grand Staircase-Escalante.

Pa pa-ya-nti
[Places Having Springs]

In the ethnographic works of Kelly (1971), the Kaibab District is subdivided into areas designating particular clusters of springs owned and occupied by certain Southern Paiute people. Unfortunately, some of the springs and areas of occupation that are mentioned by Kelly's consultants are not included within these sub-regions. In order to provide the most complete presentation of this information, we have included all of the springs originally mentioned by the experts with whom Kelly worked. To accomplish this goal we have renamed the sub-regions of Kaibab 'Areas A-K'. We have also included Kelly's classifications at the end of each citation. Kelly lists each spring by site number. In the case of springs that fall into the sub-regions defined by Kelly the sites are delineated by Roman numerals as well.

AREA A

Kanavic (Sheep Trough Spring), Togoavac (Rattlesnake Water), & Sovipac (Cottonwood Water) (1-3)

General Informational Status of these sites:

- Kinship — See Kelly 1971; Chapter 1: Habitat and Population
- Cultural Landscape — There is no information available at this time.
- Ethnographic Interviews — See Kelly 1971; Chapter 1: Habitat and Population
- Documents — Additional documents are not available at this time.

Specific Informational Status of these sites:

Kinship

According to Kelly (1971:10) Kanavic (1), Togoavac (2), and Sovipac (3) were not used as permanent settlements. Therefore, the kinship ties of particular Southern Paiute people are not specified for these sites.

Cultural Landscape

Information regarding the relationship of Kanavic (1), Togoavac (2), and Sovipac (3) to other places is not available at this time.

Ethnographic Interviews

Kelly maintains that the Southern Paiutes of Escalante used Kanavic (1) on a seasonal basis. Each year, people went to Kanavic (1) to gather botanical resources including pinenuts, and possibly materials for weaving as well. Residents of Siiumpac (4), Atankwinti (5), Sovinokwint (6), Muivac (7), and Paganktonic (8) also regularly convened to gather pinenuts at Togoavac (Rattlesnake Water, 1) and Siiumpac (Yellow, Gray [?] Water, 3).

Documents

Written information regarding Kanavic (1), Togoavac (2) and Sovipac (3) is not available at this time.

AREA B

Springs along the Vermilion Cliffs, East of Mocassin Spring (I: 4-13)

General Informational Status of these sites:

- Kinship — See Kelly 1971; Chapter 1: Habitat and Population; Sapir 1930:608
- Cultural Landscape — See Kelly 1971; Chapter 1: Habitat and Population; Sapir 1930:598
- Ethnographic Interviews — See Kelly 1971; Chapter 1: Habitat and Population; Stoffle et al. 1997:191-200
- Documents — See Kelly 1939: "Southern Paiute Shamanism".

Kinship

Cana, whose name means 'Bull Lizard', owned the Siiumpac (4), Atankwinti (5), Sovinokwint (6), Muivac (7), and Paganktonic Springs (8). Cana was a shaman, as was his brother Mimitanavi. Both Mimitanavi (Head Bent Back) and a second married brother resided at camps in proximity to Cana's home.

Just southeast of these sites dwelled a man known as Oavanapun (Alkali Man). Oavanapun also lived as a shaman. He was the father of five sons, and the owner of Ovac (9). It is unknown whether this site, whose name means 'Salt or Alkali Water', was named after its owner, or whether Oavanpun inherited this spring, and thus acquired his name. Oavanapun and his five sons resided at six separate camps located in the region of Oavac

The local chief, Pacakwi, whose name means 'To Be or To Get Wet' (Sapir, 1930, 608), owned settlements Mi tin-wogaip-paganti (10), Mi tinwava, (Pipe Spring, 11) and Pacpikaina (Mocassin Spring, 12). Pacakwi had a son, Tompocoaroc, who was known as a rattlesnake shaman. In a separate camp, resided Pacakwi's unmarried brother, Katavi.

Puisari whose name means 'Eye Dog' owned the nearby spring, Tinkanivac (Antelope Spring, 13). Puisari was married to A nawanc whose name means 'Badger Breast'. They lived with their four sons, one daughter, and Puisari's older sister's son, who was an unmarried man named Ma apituku (Painted Hip). Ma apituku was reportedly the brother of the consultant Captain George's father.

Cultural Landscape

According to Kelly (1971), Siiumpac (4), Atankwinti (5), Sovinokwint (6), Muivac (7), and Paganktonic (8) were primary sites for pinenut gathering. In addition, Sovinokwint (Cottonwood Stream, 6) served as a place for harvesting seeds in the summer. While gathering pinenuts on the mesa to the northwest, people used water from Togoavac (2) and Sovipac (3). The residents from settlements 4-8 joined with people from the neighboring springs, (9-13) for hunting trips upon the Kaibab Plateau. People occupied the site of Oavac (9) continuously. However, they made occasional trips to the Kaibab Plateau. In addition, they went to the Colorado Canyon in the winter and spring in order to gather mescal.

Mi tin-wogaip-paganti (10) consisted of two or three settlements located at base of the cliffs on either side of Pacpikaina (Mocassin Spring, 12). Mi tin-wogaip-paganti (10), Mi

tinwava (11), and Pacpikaina (12) were the sites of permanent settlements occupied on a seasonal basis, and were reputed for offering excellent water supplies. These residents visited with neighbors at Tinkanivac (Antelope Spring, 13) most of the year. In addition to wintering with their neighbors at Tinkanivac, they went with them to the Colorado Canyon west of Kanab Canyon in order to gather mescal. On this journey they would camp one night en route, and head towards the rim of the Grand Canyon the following morning. After arriving, they stayed there for approximately one month. While there they used caves for shelter and mescal, cactus (Tasi) and juniper berries for sustenance. They continued their occupation of these places into the summer, and harvested seeds along the flats by Tinkanivac. At the end of summer, they returned to their own springs, whereupon they began gathering pinenuts on mesa on top of Vermilion Cliffs. Pinion trees were reportedly scarce in that area. In the fall, the people from springs 4-8, 9, 10 and 13, united for hunting trips which took place on the Kaibab Plateau.

People from Mi tin-wogaip-paganti (10), Mi tinwava (11), and Pacpikaina (12) almost continuously occupied Tinkanivac (13). In addition, people from an unlocated spring, Wa akaari (Juniper Knoll; Yellowstone Spring, somewhere northwest of 13) (Sapir, 1930, 598, w akaririmpa, cedar knoll spring) regularly gathered at Tinkanivac, and joined others for mescal gathering and deer hunting.

Ethnographic Interviews

Extensive interviewing has been conducted on the Kaibab Paiute people's connections to the physical and cultural landscape of Pipe Springs (Mi tinwava). These interviews are available in Chapter 6 of the *Ethnographic Overview and Assessement: Zion National Park, Utah and Pipe Spring National Monument, Arizona* (1997).

Documents

Amongst the Kaibab Paiutes, Kelly (1939) identified twenty shamans, of whom two were women. Most shamans served as general practitioners, however some Kaibab shamans specialized as rattlesnake shamans, and reportedly had the capacity to heal snakebites. In addition to serving as optimal regions for gathering botanical resources, a large percentage of the people living at settlements (4-8) also practiced medicine. Of the four shamans in this area, one specialized as a rattlesnake shaman.

AREA C

Springs along the Vermilion Cliffs, Moccasin to Rigg Spring (II: 15-21)

General Informational Status of these sites:

• Kinship	See Kelly 1971; Chapter 1: Habitat and Population; Sapir1930:689
• Cultural Landscape	See Kelly 1971; Chapter 1: Habitat and Population
• Ethnographic Interviews	See Kelly 1971; Chapter 1: Habitat and Population and

Stoffle et al.1980; *Kaiparowits Coal Development and Transportation*

- Documents — There are no additional documents available at this time.

Specific Informational Status of these sites:

Kinship

A widower named Topi (White) owned three springs including Pavuavac (Point Springs) (15), which is located about two miles northeast of Mocassin, Uwantic (Rain or Water Sprinkling) (18) and Anavac (Black Ant Water, 19). After widowed, Topi lived alone. His wife, Toci ac had been a shaman. Her name means 'Gray Hair' or Toci-a-c, which translates as 'Head-Having' (Sapir 1930: 689).

The shaman, Yi ni m u, or 'Bald-Headed' owned two other springs known as Tinkanivac (Cave Water, 20) and Skumpac (Rabbit-Brush Water; Rigg Spring, 21). He was also called Nankanpi ia, 'Hairy Ear', and Takta, meaning 'English doctor'. He and his brother Mus both built houses near Tinkanivac. Mus lived there with wife and three children. In a third house lived Mus' half-brother, (first cousin), Sa atkawaiti (Doesn't Eat Mush). Sa atkawaiti was also married and had one son and one daughter.

Cultural Landscape

Both Kacoapac (14), which is located one mile north of Mocassin Spring at the base of the cliffs, and Pawiavac (Mud Water, 16) were formerly dry. The lack of ethnographic information about these springs suggests that in the absence of water these two sites were not heavily utilized.

The other springs detailed in this sub-region were intricately connected with other places. Seasonal movement of the families and communites who owned these properties generally followed one of several patterns. Topi of (15) spent the summer at Pavuavac, the fall at Anavac (19) and the winter at Uwantic (18). He gathered and prepared his own seeds on the flats below the Vermilon Cliffs because he lived alone, and met with people from Tinkanivac and Skumpac (20-21) to hunt deer on top of the Vermilion cliffs.

Sa atkawaiti and his family spent the winter and spring at Tinkanivac (20) where Kelly noted five houses covered in juniper bark. In the summer, residents of this spring gathering seeds at the base of cliffs and obtained water from Tonovac (22), Samiapac (23), and Siivac (24). These areas were not privately owned. Instead, they appeared to be places where many people would go to gather seeds. Soviwinincic (17) was also a region that was used by many people for seed gathering, and it appears not to have been privately owned. In addition to gathering and harvesting multiple plants, the people of this district hunted deer on top of the Vermilion Cliffs.

Ethnographic Interviews

Stoffle et al. (1980) *Kaiparowits Coal Development and Transportation* previously conducted interviews on sites in Area C.

Documents

At this time there are no additional documents on springs and settlements within Area C.

AREA D

Springs in the vicinity of Kanab, East to Navajo Well (III: 25-34)

General Informational Status of these sites:

• Kinship	See Kelly 1971; Chapter 1: Habitat and Population; Stewart 1941:239
• Cultural Landscape	See Kelly 1971: Chapter 1: Habitat and Population; Sapir 1930:597
• Ethnographic Interviews	See Kelly 1971; Chapter 1: Habitat and Population and Chapter 4 of this report
• Documents	See Stewart 1941:239

Specific Informational Status of these sites:

Kinship

We have consulted topographic maps for the region and have found there is both a Navajo Springs and a Navajo Well (34). The Navajo Well is located on the southern border of Grand Staircase-Escalante National Monument 1.5 miles west of the old bridge over the dry and deep precipice of White Sage Wash. Both sites served as regions of occupation for particular Southern Paiute groups. Between 1937 and 1938 Stewart (1941a:239) consulted with a Southern Paiute woman name Sarah Williams. At the time of the interview Sarah lived at Navajo Well. Stewart interviewed Sarah for one hour at this site Stewart worked through an interpreter, Fred Bullets, whom Stewart found to be an excellent translator

Another Southern Paiute individual alternately called Kami onsoc (Tries to Strike Little Rabbits) and Kwicapa aku (Excrement on Thigh) owned and occupied Sawavac (Sagebrush Water, 25). Though Kami onsoc and his wife reportedly 'stayed at Sawavac all the time they were known to join others from Kanariuipi (Willow Canyon/ Kanab Creek, 26) to hunt deer.

A great number of people resided at Kanariuipi (Willow Canyon; Kanab Creek, 26). In Camp 1 Chief Miapi (Little) lived with his wife, Cantuya (Slashed Forehead) and one child. They had other children who had previously died from unspecified causes. The wife, Cantuya

was a shaman. Chief Miapi, the shaman Cantuya, and four others who were not relatives of the couple lived at this camp. Kipi (Elbow), his wife, two boys, and the orphaned child of Kipi's older brother resided in the second camp. At a third camp Sagovonkuic (Blue Spot on Elbow) lived with his wife, one son, and two daughters.

A Southern Paiute man called Mancavait, or 'Waiving Hand' owned the region comprising Johnson Creek (Canyon, 30), Na avac (Lone Spring, 31), Muiantic, the lake east of Johnson Creek (32), and Pagawipi (Cane Canyon, 33). Mancavait was married and had one daughter and two sons. In addition, the orphaned son of Mancavait's brother lived with Mancavait's family. At a second camp T oicikaipi (Gray Squirrel) lived alone with his wife, and had no children.

Cultural Landscape

The settlements ranging along Kanab Creek were used for both permanent and semi-permanent occupation. Kanab Creek remained of central importance because it served as the primary source of water. The settlements along Kanab Creek are located on the later site of Kanab Village. There were many important settlements in this area with numerous occupants. Kami onsoc and his wife owned and occupied Sawavac (25) on a year-round basis. The owners of other settlements along Kanab Creek regularly shifted their residence at optimal times of the year. In the summer months, the people from Kanariuipi (26) would move their residence to Ciakwiavac (Oak [var.] Spring, 27), and return to Kanariuipi in the winter. While living at Ciakwiavac spring, they gathered Tasiu Root (Peteria Thompsonae Wats). They remained at Ciakwiavac through June when the seeds ripened, and returned to Kanariuipi where they harvested the seeds. Many people from settlements at springs (26, 30-34, 53, 56 & 57) also stayed at Oavac (28) and Tiavac (29), particularly when they traveled to the Paria Plateau to procure food. Additionally, they occupied settlements at Johnson Creek (30) for the duration of Mentzelia (Ku u) seed gathering. While at Johnson Creek they also gathered an unidentified root called Tsii, and in the summer they visited Alton to gather and harvest Cicaganti Seeds (Balsa Morrhiza Sagitata).

In the fall they moved to cliffs above Three Lakes (Sapir, 1930, 597, Pa(i)- yu(u)gwi-ci, water sitting) for Pasi (Artemisia) seeds and pinenuts on top of Vermilion Cliffs). In addition, they sometimes hunted deer around Orderville during the fall and joined people from Ipa (Navajo Well) to hunt deer in the Kaibab Plateau. Before the snows they returned towards with some people returning to Na avac (31) or (26) Kanariuipi where they remained for the winter.

Ethnographic Interviews

For interviews conducted in this area, see Chapter 4 of this report.

Documents

In "Cultural Element Distributions: XVIII Ute-Southern Paiute, Stewart (1941a) published a anthropological report in which he interviewed a 78 year old consultant from Navajo Springs, Utah. Stewart spoke with his consultant, Sarah Williams, through the expert interpreter

Fred Bullets. Stewart also worked extensively with Mose, who was alternately known as Bishop: an eighty-year-old Paiute elder from Parianunts. (Stewart 1941a: 239). Mose had previously consulted with Isabel Kelly, and served as one of her primary interpreters of Southern Paiute culture (Kelly 1971:13).

AREA E

Alton Area on the Upper Kanab Creek, Foot of the High Plateaus (IV)

In Area E we have included the Upper Johnson Canyon, which is part of the Kanab Creek hydrological system, and in many ways connected to the smaller region originally demarcated as Area IV in Kelly's maps from 1932.

General Informational Status of these sites:

• Kinship	See Kelly, 1971; Chapter 1: Habitat and Population
• Cultural Landscape	See Kelly 1971; Chapter 1: Habitat and Population
• Ethnographic Interviews	See Stoffle et al. 1997:187-191
• Documents	See Gregory 1951:19

Specific Informational Status of these sites:

Kinship

Timpinapun (Rock man) who was also called Yininapun (Bald-Headed Man), owned the springs of the Panwavi district. Timpinapun was a 'little chief' as well as a shaman. He lived with his wife and his son, Takwasi (Eagle Tail) who was also a shaman. Timpinapun's older sister's son sometimes resided with the family as well. Known as Poronapun (Walking Stick), the nephew of Timpinapun practiced shamanic healing too. Poronapun owned a spring to the southeast of the present town of Alton, and near the foot of the Paunsaugunt Plateau. This spring, known as Panwiavac or 'Mud Water', was near enough in proximity to Alton that he made regular trips there.

Cultural Landscape

The previous district was called Panwavi (Water [?] Grass). It was located beneath the present settlement of Alton. In the winter the people of Alton moved their residence to the more temperate zones of Kanab Creek and Glendale. A cyclical round of movement with resources and climactic conditions continued throughout the year. In the spring, they returned to Panwavi, and ate food procured from the previous season. With the ripening of seeds and the increased availability of fresh resources, the people from these settlements began harvesting, preparing, and storing foods for another year. Unlike the people living in the vicinity of Kanab and Navajo Well, those from Panwavi did not hunt deer upon the Kaibab Plateau, but rather restricted their hunting activities to the more easily accessible Paunsaugunt Plateau.

Despite the utilization of different hunting grounds, the people of Kanab, Johnson Canyon, and Navajo Well had regular contact with those living in the Water Grass district. Those from the more southern sites visited Panwavi to gather serviceberries and highland seeds.

Ethnographic Interviews

In 1997 ethnographic interviews were conducted with experts from the Kaibab Southern Paiute tribe. The results of interviews from the Upper Kanab Creek are available in Chapter 6 of the *Ethnographic Overview and Assessment: Zion National Park, Utah and Pipe Spring National Monument, Arizona* (1997).

Documents

Gregory (1951:19) has examined the region in and surrounding Skutumpah. This place served as a village site for certain Kaibab Southern Paiutes living in the GSENM. Skutumpah (Rabbit Brush Water) was chosen as an optimal site for occupation because it presented itself as "an excellent though small arable area" while also serving as an abundant source of water. Gregory claims that on Powell's Survey maps, the place of Skutumpah is recorded as Clarkston, thus suggesting that by at least 1870 non-indigenous people had begun encroaching on these Paiute lands.

After Mormon settlers usurped these lands from its Southern Paiute inhabitants, the new arrivals established farms and ranches upon these lands. Gregory (1951) notes that the Anglo ranches constructed in "Swallow Park . . . Podunk, Bullrush, Lick, Willis, Sheep, and other valleys along the south base of the Paunsaugunt Plateau. By 1951 these sites had either been completely abandoned or were only "used during the grazing seasc ;".

AREA F

Watering Places along the Vermilion Cliffs, Wildcat Canyon, and Kaibab Gulch (V: 35-46)

For purposes of the current study we have combined the upper portion of Area F and Upper G. We call this region the Upper Ankati.

General Informational Status of these sites:

• Kinship	See Kelly 1971; Chapter 1: Habitat and Population
• Cultural Landscape	See Kelly 1971; Chapter 1: Habitat and Population
• Ethnographic Interviews	See Kelly 1971; Chapter 1: Habitat and Population; Chapter 4 of this report
• Documents	Additional information is not available at this time.

Specific Informational Status of these sites:

Kinship

The father of Kelly's consultant, Mose, owned a large region encompassing sites 35-46, and had reportedly acquired these springs through his father-in-law. These sites included: Tupac (35), Mu kovac (36), Kamuwac (37), Panwiavac (38), Kanawaic (39), Kanarimpiku (40), Tinkanivac (41), Ciampivac (42), Si ivac (43), Sovpac (44), Kakarimpac (45), and Sovap (46). People called Mose's father, A piganti, meaning 'Horn'. A piganti came from the Ninkuip people; those who were named in memory of the people killed in an Apache raid. A piganti lived with his wife Kiaci (Mouth Open) at a camp located at Sovpac (Cottonwood Water, 44). They lived with two sons, of whom one acted as Kelly's consultant (Mose). In addition, the unmarried brother of A piganti, lived with the family. He was reportedly a chief 'but not much of one'. Perhaps as a consequence of his unsatisfactory performance, his title and responsibilities were later transferred to another brother.

Kelly's consultant identified four other camps located at Sovpac (44). At the second camp lived another brother of A piganti, known as Tukunimpi (Wildcat Feet). Tukunimpi married, and reportedly lived at Sovpac, though his wife reportedly resided at Ipa (Navajo Well). This information suggests that Tukunimpi probably moved residences several times over the course of his life.

Kaimu (from Kaiumpuc, meaning Hawk or Grouse) headed a third camp in this district. Kaimu was also a brother of A piguanti. He lived with his wife and her unmarried brother, Saroc. At the fourth camp located at Kanarimpiku (Knoll [?], 40) lived Saiturn (White Spots) who was also related to A piguanti, though the type of relationship is never specified. Kelly's consultants reported different findings regarding Saiturn's family life. He may have had a wife and son, though another consultant states that he was unmarried. These findings suggest that Saiturn may have been widowed.

Cultural Landscape

The sites along the Vermilion Cliffs as well as the surrounding vicinities were connected through the life giving passages of water as well as their position within the canyon as a whole. The Southern Paiute name for this region is Ankati, which literally translates as 'intersection of creeks'. Ankati refers to the region comprising Kanarimpiku (40) to the north of the White Cliffs and Kakarimpac (Kaibab Gulch, 45), which runs southeast south from the Vermilion Cliffs, and eventually intersects with the Paria River. The three intersecting canyons of Ankati include Kanarimpiku (Wildcat Canyon?), Sovpac (Kitchen Canyon?) and Kiabakuwak (Kitchen Creek Canyon?).

Ethnographic Interviews

Kelly's information strongly suggests that movements between springs along the Vermilion Cliffs, in Wildcat Canyon, and Kaibab Gulch were very finely orchestrated affairs. The chiefs of each group frequently directed the seasonal movements between permanent

settlements. In addition to relegating this responsibility to an officially designated leader, the people from particular sites regularly met up with certain groups for hunting, food procurement, and events that enhanced group cohesiveness. The shifting of settlements in responses to climactic changes also allowed particular Paiute people to attune themselves to slight environmental changes, and thus establish a balanced relationship with their environments.

In the summer of 2000, additional ethnographic interviews were conducted within Area H. In Chapter 4 of the current report we detail information relating to the site of No Man's Mesa.

Documents

Additional information on Area F is not available at this time.

AREA G

Ankati: Spring at the base of Paunsaugunt Plateau (VI: 47-52)

For purposes of the current study we have combined the upper portion of Area F and Upper G. We call this region the Upper Ankati.

General Informational Status of these sites:

• Kinship	See Kelly 1971; Chapter 1: Habitat and Population
• Cultural Landscape	See Kelly 1971; Chapter 1: Habitat and Population
• Ethnographic Interviews	See Chapter 4 of this report.
• Documents	See Gregory 1951:84; Shaul and Senarlson 1997:42

Specific Informational Status of these sites:

Kinship

Tapunapun owned Piki-pa (Rotten Water, 47), Atavaç (Sand Water, 48), Wigimpac (Vulva Spring, 49), Pagari (Reservoir/Pot Hole, 50), Timpiku (Rock Hole, 51), and Kanankwicic (Willow Run, 52). At one point Tapunapun lived with his brother, O oisic, but later married, and changed residence. Tanpunapun knew the people from the springs along the Vermilion Cliffs, Wildcat Canyon, and Kaibab Gulch (35-46) quite well. During the winter he would usually move in with them or move towards the base of the White Cliffs.

Cultural Landscape

Tapunapun lived at permanent settlements between sites 47 and 52 during the spring, summer and fall. During the winter he moved to settlements between sites 35-46. The land around sites 47-52 was reportedly sparsely populated. Kelly chose to present this area as a discrete region from the watering places along the Vermilion Cliffs, Wildcat Canyon, and Kaibab Gulch (35-46) because the residents of this area did not mention traveling to the Kaibab Plateau to hunt deer, nor to Nankoweap to gather mescal.

Ethnographic Interviews

Interviews were conducted in the summer of 2000 at sites within the Upper Ankati, which is comprised of the upper portions of Area G and Area F. A detailed description of this information is available in Chapter 4 of the current report.

Documents

Interview sites (Summer 2000) and prominent markers within the Paunsaugunt Landscape are further detailed in the works of Gregory (1951). "As viewed from Rainbow Point, the country [of the Pausaugunt region] descends southward in a orderly succession of terraces miles in width, separated by cliffs hundreds of feet high, across the White Cliffs and the Vermilion Cliffs to the Kanab Plateau, 40 miles distant and 4,000 feet below.

The terraces are trenched by deep gorges, and from their floors rise small mesas, platforms, and towers, and such prominent erosion remnants as No Mans Mesa and White Cone (Tabetimp). Tabetimp or White Cone (Gregory 1951:84) represents the geological formation known today as Mollies Nipple.

According to a Paiute dictionary assembled by Shaul and Senarlson (1997:42), ta'api signifies milk, and tempi refers to stone, rock, iron, and money. This interpretation is consistent with Sapir: 1931:674, who notes that timpi means iron, stone, or rock.

AREA H

Upper Houserock Valley (Empty Basket- Ousuk?) (VII: 54)

General Informational Status of these sites:

- Kinship — See Kelly, 1971; Chapter 1: Habitat and Population
- Cultural Landscape — See Kelly 1971; Chapter 1: Habitat and Population
- Ethnographic Interviews — There are no interviews available at this time
- Documents — See Escalante 1854:515; Bolton 1928:69

Specific Informational Status of these sites:

Kinship

The shaman Tanui lived on the eastside of Houserock Valley at Pagampaci (Cane Water). Three camps including Tanui, Cavuiya, and Antitiav were noted at this site, and there was reportedly no chief.

Cultural Landscape

Kelly (1971:17) notes that virtually all the springs are located along the base of the Vermilion Cliffs. As a consequence this is the place where the camps of early Southern Paiutes are heavily clustered.

Those from District VI tended to spend the winter at Pagampaci, and the spring and fall along the lower slopes of the Kaibab Plateau. Here they hunted deer and procured roots. In the summer, they harvest seeds around Pagampaci.

Ethnographic Interviews

There are no interviews available at this time.

Documents

Kelly (1971) notes that Escalante recorded a sighting of an encampment strongly resembling descriptions of [Ousuk] (Documentos: 1854: 515 in Kelly 1971:17). Escalante came across this settlement after crossing the northern stretch of the Kaibab Plateau. Furthermore, Escalante called the indigenous people of this region "Paganpache" (Bolton 1928:69 in Kelly 1971:17) which derives from the name of the spring, Pagampaci.

AREA I:

Lower Houserock Valley, and Cane Ranch to the South, : t the eastern base of Kaibab Plateau (VIII: 55-59)

General Informational Status of these sites:

- Kinship — See Kelly 1971; Chapter 1: Habitat and Population
- Cultural Landscape — See Kelly 1971; Chapter 1: Habitat and Population
- Ethnographic Interviews — See Kelly 1971; Chapter 1: Habitat and Population
- Documents — See Dellenbaugh 1909:362n

Specific Informational Status of these sites:

Kinship

There were approximately ten camps at Kankwi (Water Singing/Houserock Spring, 55). Kelly's consultants identified Tasiaci (Early Morning) as the owner of these springs. He lived with his mother, Miapi-magugui (Little Woman) and his wife. At a second camp lived Sagwoarokovac (Blue Tattoo), his wife, an older son known as Kwaganti or quiet man, and several other children. At a third camp lived Winituic (Setting Post) and her unmarried son Stavi who was the first cousin of Mose of Kwaganti. Finally, the consultant remembered a man known as Tavinwawici (Sun Slope) living at a fourth site with his wife and several children.

After the death of Tasiaci, the ownership of (Ousuck) transferred to Kwaganti and the shaman, Keno (Crooked Elbow).

A man called Sakic (Crackling Step) owned Mukuvac (56), which Kelly estimates housed the largest number of occupants next to Sovinokwicic (Soap Creek, 65). Some of the residents of this spring included: Sakic, his wife and many children, of whom only one daughter survived. Next, the consultant remembered an elder named Kan annapin, or 'Root Man' who was a distant relative of Sakic. Kanannapin lived with his wife, as well as her two sisters, and several brothers. Another distant relative of Sakic's, Tukmic (Wildcat Whiskers) lived with his wife, their children, Tukumic's two sisters, their husbands, and their children. Tavinwawici (Sun Slope) and his family also resided at least part of the time at Mukuvac.

After Sakic died, Mukuvac became the property of Kwaganti, whose mother was Sakic's younger sister. The property passed to Kwaganti because all of Sakic's children except one married daughter had died. Kwaganti also came into possession of Oarinkanivac (59) and jointly owned Kankwi (55) along with Keno. During this period the following people lived in two camps at Mukuvac (56): Kwaganti, his brother Anikwitu, Anikwitu's wife, and three children. Later Kwaganti married Na anoi i. At the second camp lived Winituic and her son, Stavi.

Cultural Landscape

Those who lived at Kankwi had extensive connections to other springs, regions, and communities. Each winter the residents of Kankwi moved to Mukuvac (56). After winter passed, they would sometimes go with the people from Mukuvac to Oarinkanivac (Salt-Cave Water, Cane Ranch 59). From Oarinkanivac they traveled along the flats of the Vermilion Cliffs and Pagampiaganti (Cane Ranch) gathering seeds. When deer hunting they would camp at the springs of Tasiaci on both the east and north sides of the lake. These springs were known respectively as Tamavac and Kwitipac. They continued traveling through the fall through the Paria Plateau where they gathered pinenuts, camping at the spring known as Wiivac. After gathering and harvesting resources for the winter, they returned to Mukuvac, where they remained until spring. Only in summer did they finally return to Kankwi.

The residents of Mukuvac (56) wintered in a cave at Oarinkanivac, while storing most of their food caches in Mukuvac. They developed a system of settlement, movement, and resource procurement that allowed them to optimize the resources made available to them through their environment. During the summer they gathered Chenopodium, Epicampes, and Oryzopsis in Mukuvac. Towards the end of summer they went to the Kaibab Plateau, and sometimes the Paria Plateau to hunt deer and gather pinenuts. When resources were scarce, they also gathered mescal in the Colorado Canyon.

Ethnographic Interviews

Kelly reports that occupants of Mukuvac (56), Tumaranpaganti (60), and Winorumpac (61) used Sikiava (Fissure, 58). However, Sikiava was not permanently inhabited due to a lack of sufficient water.

Documents

Kelly (1971:19) reports that Powell (Dellenbaugh 1909: 362n) renamed Kwaganti's land 'Kwagunt Valley'. According to this account, Kwaganti's father allegedly gave this land to Powell.

AREA J

Springs on Marble Platform, at the base of Vermilion Cliffs, at Cane Ranch, and at the eastern base of the Kaibab Plateau (IX: 60-62, 64, 67, 68)

General Informational Status of these sites:

• Kinship	See Kelly 1971; Chapter 1: Habitat and Population
• Cultural Landscape	See Kelly 1971; Chapter 1: Habitat and Population
• Ethnographic Interviews	See Kelly 1971; Chapter 1: Habitat and Population
• Documents	There is no other information available at this time.

Specific Informational Status of these sites:

Kinship

The shaman Niwarimpi (Snow Heel) owned Tumaranpaganti (whose name derives from the plant timari, 60) and Winorumpac (Arrowhead Water, 61). He lived with his wife. His three married sons, three married daughters, and all of their children lived at separate camps within the area. When the elder Niwarimpi died, "all the children moved away and nobody owned the spring".

One family later occupied Sovinokwicic (Cottonwood Running, 65). This family was headed by Sina atan (Sinarin, Coyote Teeth) who lived with his wife and two children. Kelly notes that Naragowoci of Sinavac (76) owned Ogontinava (69), Paiyampagati (70), Pagwuiacpikanti (71), Piacampipkwitic (72), Ankapi (73), and Mo onticivac (74). Although he owned these lands, he spent most of his time in Sinavac (76). Kisaici (Mouth Open) owned Pagampiaganti (Cane Ranch, 67) and lived alone. Several other camps at Pagampiaganti housed the brother shamans, Saitimpi (White Spot Mouth) and Kwiuinimpi (Crooked Feet) as well as Saitimpi's daughter.

An important chief known as Kwinivac (Stands Straight) owned the springs called Kwiavac (Oak Water, 68). Kwinivac served as chief for the people of Tumaranpaganti (60), Winorumpac (61), and Kwiavac (68). Three camps are noted at Kwiavac: At the first camp Kwinivac lived with his brother, both whom eventually married two sisters. Other residents included Niaku u (Chest) and his wife Capw uiuvi, (Wrinkled Eyes), who was the sister of Kwinivac, and Muiait (No Nose) and her husband.

Cultural Landscape

Niwarimpi and his family moved to Winorumpac (Arrowhead Water) during the fall in order to collect pasi and kwakwe, and pagankwakwe seeds. They also traveled to Kaibab Plateau to hunt deer, and Paria Plateau to gather pinenuts. The residents of Pagampiaganti also moved to accommodate their needs to the changes in the environment. As a result they wintered near the rim of the Colorado Canyon or even in the mouth of Kanab Canyon. The people of Kwiavac moved to the Kaibab Plateau in the summer to gather seeds, and the winter to hunt deer. They also wintered beneath the rim of the Colorado Canyon near the southeast base of Kaibab Plateau.

Ethnographic Interviews

Additional interviews upon Area J sites are not available at this time.

Documents

Additional documents are not available at this time.

AREA K

Springs at the western base of Kaibab Plateau (X: 75-77)

General Informational Status of these sites:

• Kinship	See Kelly 1971; Chapter 1: Habitat and Population
• Cultural Landscape	See Kelly 1971; Chapter 1: Habitat and Population
• Ethnographic Interviews	There are no additional interviews available at this time.
• Documents	There are no additional documents at this time.

Specific Informational Status of these sites:

Kinship

An elderly widower, Puntuwaci (Swirl) owned Maavawiniti Spring (Tree in Water). He resided there with his two daughters. The daughters both married Kanu (Sings Song), a man originally from the Moccasin district. Each wife gave birth to a daughter. When their father died, his daughters and Kanu became the new owners of the spring. At a second camp lived Ka auc (Knees) and a woman to whom he may have been married.

At Sinavac (Coyote Water, 76) Kelly's consultants identified seven camps. 1) At the first camp lived the shaman and 'big chief' Naragowoci (Tattooed?). He lived with his wife, sister, and four individuals that were not identified. 2) At a second camp lived Uipamugaci (Creek, edge of cliffs) along with his wife and two children. 3) Pa antim (Long Penis) lived with his wife and four children at a third settlement. 4) Other camps included Anjkapii (Red Arm), his wife (Mu uri, Crane's Neck) and their two sons and daughters, as well as Mu uri's parents: Ya

aicomoni (Dead Leaf) and Panagumpi (Metal Tongue). 5) Squirrel Tail and his wife one side of face lived at camp five with three sons and one daughter. 6) Mu uc, his wife Mu wiaiti, and their three children lived at camp six, and 7) Copicgaiki (Broken Ankle and Foot Turned In) lived with his wife and three children at a camp somewhat distant from the others.

Oa cki (Yellow Squeeze) owned Sagwogo acpa (Tobacco Water: 77), where he lived with his wife and three daughters. Upon death, the came was taken over by his younger sister's son.

Cultural Landscape

On the western base of the Kaibab Plateau, Kelly (1971) notes three springs, Maavawiniti (Tree in Water, 75), Sinavac (Coyote Water, 76) and Sagwogo acpa (Tobacco Water, 77) that supported a large population. These springs are reportedly located at "the heads of small canyons that drain the Kanab".

Ethnographic Interviews

There are no additional interviews available at this time.

Documents

There are no additional documents available at this time.

As the works of Kelly (1971), Sapir (1930), Stewart (1941), and others demonstrate, the perennial springs of the GSE/NM were central in the lives of the Southern Paiutes who resided in these portions of the Southern Paiute territories for thousands of years. Just as the Paiutes found innovating methods for living well in environments renowned for a scarcity of resources, the animals and plants found means of responding to high variability in rainfall and available foods. In the next chapter, we examine the prevalent geology, geography, botany, and animal presence at several sites within the GSE/NM identified by Southern Paiute consultants of the present as well as the 1930s (Kelly's consultants) as being particularly significant.

Chapter 4
Selected Grand Staircase/Escalante Places

This chapter is about selected places in GS/ENM as they are understood and have meaning to contemporary Kaibab Paiute people. As such, the main goal of the chapter is to assist the managers of the GS/ENM to recognize and understand Paiute cultural resources and places. Permitting the Paiute voice regarding these places and resources to be accurately heard is crucial to the process of creatingculturally sensitive land management practices.

The Kaibab Paiute tribe and their elder representatives who participated in this study view this chapter as a beginning rather than end. This report, and especially this elder-based interview chapter, is termed a "living document." It is by definition not complete and is in fact perceived by the Kaibab Paiute council as only a beginning.

The value of a living document is that it can be expanded by any future site visits, however extensive they may be. New sites can be added and extant sites can be productively visited. The only requirement is that during each site visit the same elder interview instrument be used and that funds be provided to add the new elder insights into latter versions of the report. Before proceeding with a site-by-site discussion, it is important to consider the methodological implications of how cultural knowledge is distributed.

Paiute Knowledge and Its Distribution

The foundations of this chapter are oral interviews conducted with members of the Kaibab Paiute tribe. All of these people were selected by the tribal government to represent the cultural opinions and interests of their tribe. However, both elders and the tribal council recognize that the ideas they present represent only a portion of the total Paiute knowledge about these places.

The distribution of knowledge is intimately connected to marriage practices. Paiute people have always intermarried with Southern Paiutes from places that were traditionally known as districts (see Chapter 2 for a full discussion on districts). This practice continues today. Cultural knowledge goes where people go. Consequently, people who know about the GS/ENM live in many places and are members of various Paiute tribes. Thus, full access to this ethnic (or national) knowledge base needs to involve systematic site-specific ethnographic interviews with elder from all Southern Paiute tribes.

The 13 contemporary tribes of the Southern Paiute Nation are:

Kaibab Paiute Tribe, Arizona
Paiute Indian Tribe of Utah
Kanosh Band
Koosharum Band
Cedar City Band
Indian Peaks Band
Shivwits Band
San Juan Southern Paiute Tribe
Moapa Paiute Tribe
Pahrump Paiute Tribe (seeking recognition)
Chemehuevi Paiute Tribe
Colorado River Indian Tribes
Chemehuevi Band
Twenty-Nine Palms Paiute Tribe

It should be noted that the Twenty-nine Palms Paiute Tribe (Trafzer, Madrigal, and Madrigal 1997) is currently seeking official recognition as a member of the Southern Paiute Nation. To date, they have received this recognition from the CRIT – Chemehuevi Band and the Chemehuevi Paiute Tribe.

This chapter is based on elder interviews guided by instruments developed in conjunction with the Kaibab Paiute tribe and other Southern Paiute peoples. The Site-Specific instrument was developed during the 1995 study of Paiute cultural resources in Zion National Park and Pipe Spring National Monument (Stoffle, Austin, Halmo, and Banks 1996). That study challenged the UofA research team to construct a data-gathering instrument that would permit interviews to occur on any topic that may arise during visits to different sites.

Utilization of this instrument signifies a departure from earlier cultural resource studies. Previously, each study was directed towards investigating a specific resource and the places where such resources could be found. For example, members of the research time would decide to study archaeology sites. Consequently, places noted for particular types of archaeology were selected. Under this arrangement, the tribal councils would send people who knew about archaeology sites. A similar research design occurred if the study focused on plants or animals. A particular instrument would be developed for each resource. Having twelve pages of resource specific questions was not uncommon. In the Zion-Pipe Spring study, researchers departed from this approach. The National Park Service (NPS) viewed this study as being an initial exploration to be conducted at a variety of places. Accordingly, some of places and types of investions would be decided on during the study itself.

The UofA team made an interview instrument that would permit elders and researchers to visit any place and interview on any aspect of that place that the visiting elder viewed as culturally important to the Paiute people. Out of a group of six elders visiting a place during the Zion-Pipe Spring study some consultants would express interests in plants and animals, while others would share thoughts on the archaeology or geology of the place. The currently used site

form is very flexible in this respect, but sometimes limited in other regards. While the resource specific form might yield up to twelve pages of questions regarding each plant, animal, or archaeology site, the current interview instrument generates information from a more holistic stance. It is clear that each approach yields distinctive benefits and makes special contributions contribution to expanding knowledge of people, places, and resources by providing a venue in which any resource that is identified by an elder can be included, or through the provision of resource-specific forms designed to gather a great deal of knowledge about a specific resources.

The obvious questions for a Federal land manager and for tribal council members is, 'When have sufficient interviews occurred in order to make an authoritative decision about cultural places and resources?' Certainly, it is possible for one elder to visit a location and make an identification that will be recognized as valid by both his tribe and ethnic group and the Federal land manager. A good example is a widely recognized spiritual place like Vulcan's Anvil in the middle of the Colorado River in the Grand Canyon. This is a medicine rock used for curing and both Paiute and Hualapai share this understanding. On the other hand, knowledge about some things is unevenly distributed and widely scattered. The recent article on Southern Paiute plant knowledge, called "*Puchuxwavaats Uapi* (To Know Plants): Traditional Knowledge and the Cultural Significance of Southern Paiute Plants" (Stoffle, Halmo, and Evans 1999:426), provides direct research and statistical evidence that,

1. Southern Paiute people as an ethnic group retain vast funds of knowledge regarding traditional plants, even though this knowledge is dispersed and unevenly distributed among individuals;
2. Female elders appear to be "keystone' individuals who possess greater funds of knowledge regarding plants and their uses;
3. Multiple interviews (up to eighteen were used in this case) with a wide range of ethnic groups members may be required to fully articulate the cultural significance of a particular plant at the ethnic group level; and
4. Project-specific ICS scores for a specific plant can be analyzed comparatively to derive composite values that approximated the ethnic perception of the cultural significant of particular plants.

This ethnobotanical analysis was made possible because the UofA research team has worked with Southern Paiute people since 1972 and these Paiute people have worked to explain their knowledge of and interest in plants so that they can be properly protected by Federal land management agencies. The article recognizes by name many of the Paiute elders who have shared their plant knowledge. The analysis also was made possible because an ethnobotanical interview instrument was developed and used consistently for over a decade.

Thus a systematical ethnobotanical database was created from which insights regarding the distribution of plant knowledge can be understood. Therefore, unlike the commonly held recognition among Paiute people that Vulcan's Anvil is a medicine place, plant knowledge is unevenly distributed among people, between males and females, and between the young and the old. To return to the original question, 'When can we feel that sufficient elder interviews have occurred?' the answer is 'When the tribal councils and their elders from all Southern Paiute tribes agree that the findings are complete'.

Site-By-Site Analysis

The following portion of the chapter presents a site-by-site analysis of the cultural importance of various places in GS/ENM. The spatial size of the place under analysis varies from a rather narrow description of Navajo Spring to a rather large analysis of the areas around No Man's Mesa. Variances in the size of these areas derive from how clearly the sites are traditionally bounded by Paiute uses patterns. In general, as more information is provided by future studies the sites under analysis will become spatially smaller. All sites discussed are directly culturally connected to the GS/ENM, but two are at the edge and extend beyond the boundary of GS/ENM.

The analysis is based on interviews with Kaibab Paiute elders. Each site description describes its the geological characteristics, plant and animals, whether or not these plants were used by Paiute people, and what elders think of this area and the resources it contains. Sites that are discussed in other chapters of this report are cross-referenced.

Skutumpah – Rabbitbrush Water

[See Chapter 3 – designated Area E. This area is referred to as 21. Skumpac (Rabbit-Brush Water; Rigg Spring) (Kelly 1971:9).]

Study Area Description

This study area is located in Johnson Canyon, east of Kanab Creek approximately 22 kilometers southeast of Alton, Kane County, Utah at the junction of Johnson Canyon Road, Glendale Bench Road, and Skutumpah Road at an elevation of 1775 meters above sea level, 37° 13' 828" N latitude, and 112° 22' 171" W longitude Within this study area, which is 25 kilometers north of U.S. Route 89, Skutumpah Creek traverses Skutumpah Terrace- a broad belt of flat land crossed by south-flowing streams that originate and terminate within canyons (Gregory 1963:13) northwest of Timber Mountain. The Skutumpah Terrace extends from the Parunuweap Valley northeastward to the Paria River, a distance of approximately 40 miles. The southern edge of the terrace is sharply outlined by the White Cliffs (Gregory 1950:7). It is one of the great rock steps that lead from the Colorado River to the crest of the High Plateaus (Gregory 1951:101). Historically, the Skutumpah Terrace and the adjoining highlands have been heavily grazed. The Skutumpah Terrace is the site of ranches and cultivated fields. In the 1950s, it provided one of the only east-west routes accessible for wagons through the rugged precipices and canyons between the Vermilion Cliffs and the Pink Cliffs (Gregory 1951:102). The legal location of the site is T41S R5W Sec. 7 NE4. Running for approximately 46 miles between Johnson Canyon and Kodachrome Basin, the rugged and graded dirt surfaced Skutumpah Road traverses some remarkable country that has been carved by streams and canyons. This route provides access to Deer Springs Wash, Bull Valley Gorge and some steps and terraces of the Grand Staircase. Within the area, riparian ecosystems serve as corridors for neo-tropical migratory birds and local fauna. Johnson Creek and its tributaries provide habitat, which supports the movement and hence, the long-term viability of native animal populations.

Botanical inventory and photodocumentation were executed along both sides of Johnson Canyon Road, adjacent to private ranches within Grand Staircase-Escalante National Monument. The road is the approximate boundary between the Great Basin Conifer Woodland (Pinyon-Juniper) vegetation upslope and Great Basin Desert Shrub (Big sagebrush, *Artemisia tridentata)* across the floodplain of Kanab Creek at Cedar Flats. Much of the valley floor has been severely impacted by chaining, which has been used in the past to remove pinyon and juniper prior to reseeding with perennial grasses (Bureau of Land Management 1999:26).

Livestock grazing is permitted on public land within the study area. Overgrazing has further devastated the natural vegetation in this location, thus contributing to the erosion of Johnson Wash. Currently and historically, the valley floor has been used for the cultivation of alfalfa, *Medicago sativa.* The dense growth of sagebrush is an indication of the successful colonization of this shrub as a result of disturbance by grazing, chaining and cultivation. Incised channels developed after farmers tried to divert runoff from the center of the valley toward the valley margin (Webb, Smith and McCord 1991:5). Farming has had a significant impact on the hydrology of the region because on private land, water is diverted out of the channels to irrigate the farmland and the runoff returns to the creek beds. When the water returns, it may carry remnants of chemicals used to spray the fields (Bureau of Land Management 1999:101). Before the settlers arrived with their stock, Johnson Wash was lushly covered with meadow grasses. One year in the 1880s, the meadows were so wet that they could not be cut. As a response to the precipitation, a man by the name of Shumway plowed a furrow through the center of the Johnson Valley to drain off the excess moisture. As a result, the protective and stabilizing cover of sod was destroyed and from that day forth, severe erosion and irreparable damage occurred after every rainstorm (Webb, Smith and McCord 1991:29). The farming towns of Skutumpah and Johnson were founded in the 1870s, but were abandoned by the 1920s because of extensive erosion to Johnson Wash and its tributaries (Webb, Smith and McCord 1991:18).

Powell designated the great pile of sediments rising above the Grand Canyon platform the Chocolate Cliffs, Vermilion Cliffs, White Cliffs, Gray Cliffs, and Pink Cliffs. These cliffs provide a colorful record of the age and origin of 10,000 feet of Mesozoic and Eocene strata (Gregory 1950:46). The White Cliffs, belonging to the Navajo Sandstone Formation of the Jurassic can be viewed from within the study area. Soils along the valley floor are of alluvial origin from Kanab Creek. They are deep soils, consisting of sand and silt. On the slopes, soils are a heavy, dark gray clay-shale with sandstone and rocks of volcanic origin embedded. The slopes alternate between rounded ridges and shallow, steep-sided drainages. Kanab Creek and its principal tributary, Johnson Creek rise at the rim of the High Plateaus and flow southward across Tertiary, Jurassic, and Triassic beds along their course through canyons, terraced river flats, and meadowlands. Such features reflect the relative resistance to erosion of the various formations (Gregory 1950:164).

Botanical Interpretation

Within the study area at approximately 2376 meters above sea level, the slopes are dominated by Colorado pinyon, Utah juniper, and groves of Gambel oak *(Quercus gambelii).* Buckbrush *(Purshia tridentata),* snowberry *(Symphoricarpos longiflora) and* American plum *(Prunus americana),* an escaped cultivated shrub, are important shrubby plants in the understory. Herbaceous ground cover is scattered, and there is much bare soil between trees and shrubs. One elder recognized twinpod *(Physaria newberryi),* a perennial herb of the Mustard family, as having cultural significance within the study area. This species had not been noted previously. Paiute plants are listed in bold print below along with other plants observed within the study area at 2376 meters above sea level.

Scientific Name	Common Name
Amelanchier utahensis	**Utah serviceberry**
Arctium minus	Burdock
Artemisia tridentata	**Big sagebrush**
Berberis repens	Creeping barberry
Bromus tectorum	Cheatgrass
Cercocarpus montanus	Alder-leaf mountain-mahogany
Chrysothamnus nauseosus	**Rubber rabbitbrush**
Chrysothamnus viscidiflorus	Viscid rabbitbrush
Juniperus osteosperma	**Utah juniper**
Juniperus scopulorum	**Rocky Mountain juniper**
Lepidium sp.	Peppergrass
Malcomia africana	African mustard
Pedicularis centranthera	Pinyon-juniper lousewort
Penstemon linarioides	Siler's penstemon
Phlox austromontana	Desert phlox
Physaria newberryi	**Newberry twinpod**
Pinus edulis	**Two-needle pinyon**
Plantago major	Common plantain
Populus alba	White poplar
Prunus americana	American plum
Purshia tridentata	**Bitterbrush**
Quercus gambelii	**Gambel's oak**
Ribes cereum	**Wax or squaw currant**
Rosa woodsii	**Woods wild rose**
Senecio multilobatus	Uinta groundsel
Symphoricarpos longiflorus	**Long-flower snowberry**
Taraxacum officinale	Common dandelion
Zigadenus paniculatus	**Foothills death camas**

At the junction of Johnson Canyon Road, Glendale Bench Road, and Skutumpah Road at an elevation of 1775 meters, the following plant species were observed in a disturbed area adjacent to private ranches within Grand Staircase-Escalante/NM. Historically, the headwaters of Johnson Wash were grazed during late spring through fall. As a result, damage to and consequent reduction of palatable grasses and shrubs has been severe. By the year 1956, a mere 41 hectares of a total 695 hectares of irrigable land remained in native vegetation. Less desirable plants, such as Four-wing saltbush (*Atriplex canescens*) replaced more palatable species. Agricultural activities such as dam and ditch construction, and draining of meadows for the cultivation of exotic grasses and alfalfa, have had a significant impact on channel erosion within Johnson Canyon (Webb, Smith and McCord 1991:21).

The great diversity of substrates spanning several life zones within the study area results in a high level of plant endemism. Warm and cold desert floras are represented within the Skutumpah area within Grand Staircase-Escalante National Monument, which is considered one of the richest floristic regions in the Intermountain West (Bureau of Land Management 1999:22). Paiute plants are listed in bold print along with other plants observed at this location.

Scientific Name	Common Name
Agropyron cristatum	Crested wheatgrass
Argemone munita	Armed prickly-poppy
Artemisia filifolia	**Sand Sagebrush**
Artemisia tridentata	**Big sagebrush**
Atriplex canescens	**Four-wing saltbush**
Bromus tectorum	Cheatgrass
Camissonia sp.	Camissonia
Chrysothamnus nauseosus	**Rubber rabbitbrush**
Convolvulus arvensis	Bindweed
Descurainia pinnata	**Pinnate tansy-mustard**
Descurainia sophia	**Flixweed**
Gutierrezia sarothrae	**Broom snakeweed**
Halogeton glomeratus	Halogeton
Juniperus osteosperma	**Utah juniper**
Juniperus scopulorum	**Rocky Mountain juniper**
Medicago sativa	Alfalfa
Melilotus officinalis	Yellow sweet-clover
Oryzopsis hymenoides	**Indian ricegrass**
Pinus edulis	**Two-needle pinyon**
Purshia tridentata	**Bitterbrush**
Quercus gambelii	**Gambel's oak**
Salsola tragus	Russian-thistle
Sisymbrium altissimum	**Tumbling mustard**
Sphaeralcea coccinea	**Common globemallow**
Tragopogon dubius	Yellow salsify
Verbascum thapsus	Woolly mullein

Southern Paiute Interpretation

At one time many Southern Paiutes resided upon the Upper Kanab Creek for the duration of each summer. While living at this location, Paiute people cultivated gardens that were irrigated with water from the Kanab Creek. In addition, Paiute people collected plant resources and hunted animals that lived in the vicinity. In addition,when people from Orderville and Johnson Canyon migrated back and forth to the lakes, the Upper Kanab Creek environs served as part of their transhumant adaptive strategy. Paiutes preferred well-watered higher elevation locations for their summer residences. Kelly (1971:14) noted that Southern Paiutes from Kanab, Johnson Canyon and Navajo Well sometimes visited Alton from summer to fall to collect berries and highland seeds (*Artemisia* sp. and *Balsamorrhiza sagittata*). Such areas provided a rich diversity of plant and animal resources. From this location, people would travel to Indian Peak to collect pinenuts for winter storage and provision. Locations such as these were used not only for resource harvesting purposes, but also for religious and social activities, including exchange and reciprocal use rights between intermarried groups or district members. Networks would have extended through this area from Kaibab in the south to Richfield in the north. Trade was also conducted between Paiute residents at this spot and kinsmen from the west. One elder noted:

> *Whoever was passing by could tell them where to go next [to hunt or gather. They would] collect certain willows in spring before sap came, and clay...[They would] share it with people who didn't have that material, and in return they would also trade them for something else. That way they would bring things to other people and sharing it, you know they were together like in sharing the land. They were doing that in the old days, they would move to Kaibab Mountains. It was mostly the Kaibab people who went down there to gather elderberries, and pinyon nuts, and cactus fruit, all kinds of cactus fruit they gathered on Kaibab. And in the winter when they traded with people that had different kind[s] of [food], like that choke cherries, the people from the west brought that over towards Kaibab, so they could trade with them for whatever kind of fruit they had and it seemed that they lived such a good life, they had vegetables, and they had everything they wanted...*

Features

Water. The waters of Kanab Creek were pointed out as being important for irrigation all through Johnson Canyon and for human and animal consumption. Water pockets may also have been important sources of water. The water from Kanab Creek was also used in ceremonies held at the location. A Kaibab elder discussed the springs in the area:

> *The white people had occupied the springs in the region. Now, you can't get into them because they have been padlocked. There are a lot of springs throughout the whole area...So when our people traveled the foothills, they knew where the water holes were.*

Plants. Squawbush, pinenut, acorns, yucca, and gooseberries were mentioned as being used for food and manufacture. Medicinal plants in the area were sagebrush, which was brewed

for colds, and buckbrush. The newly identified Newberry twinpod, a member of the mustard family, was pointed out as having a useful bright yellow flower, which was used in the coloring of baskets. Tansy mustard, *Descurainia* seeds were made into a mush and sometimes mixed with snow as a confection (Kelly 1971:42). The seeds were also ground into flour for bread, mixed with other seeds and used as a good condiment. The plants were also cooked as a potherb. (Bye 1972:93). Kaibab representatives discussed other native plants and farming in the area:

> Sage roots have good fiber. The cedar and sage were used for healing. There was some farming by the creeks and washes. They would farm plants they could use...such as corn.

Animals. This location provided a diversity of large and small game. Deer, elk, mountain lion, wolf, sage hen, rabbit, and cottontail were mentioned as being hunted for food and clothing within this area. Deer parts were also used in ceremonies. While conducting interviews, elders observed a pair of golden eagles *(Aquila chrysaetos)* flying over a rock-writing site within the Skutumpah region. Several peregrine falcon (*Falco peregrinus)* were also sighted within the study area. One elder commented on the Southern Paiute hunting ethic:

> *Those were the things that they were really protecting at the time when they had plenty of meat, they didn't want them to be killed just for the joy of killing animals, people weren't allowed to do that...and I think that rule was provided by our chief, and it's been carried on throughout the years...it was their land, but then the Mormons come and...come and they have to do away with some of the animals...they kill them, they poison them...*

Evidence of Previous Paiute Occupation/Use. One elder noted, "Where there's water, there's artifacts". The elder believed there was probably evidence of food processing (grinding stones), pottery, and arrowpoints present in the area of Kanab Creek. In the Skutumpah area, which has been used extensively by Southern Paiute people, there are rock-writing sites. These places are highly valued by Kaibab Paiute people who have intrinsic cultural ties to the area. A Kaibab elder discussed the area:

> There were Paiute villages in Johnson Canyon. This area was one of the main part of where they roamed. A lot of the people were born here. There are a lot of petroglyphs in Johnson Canyon and they were destroyed.

Physical/Geologic Features. The mountains were mentioned as places of worship and ceremony. Caves in the area would have been used for the same purposes. A Kaibab elder spoke about his travels in the region:

> Doc Brown owned a place up in Johnson Canyon, up by Nephi...We would take a trip on horseback up by Johnson Lakes. They had some grandmas... mean ones! It was a country road, not a good road. I have been out through here a long time ago. Stanley, Warren and I worked here. We were in the movies up in Johnson Canyon. In Johnson Canyon, there were western movies for the Lone Ranger. They made a lot of movies here.

Perceived Impacts

The primary impacts to this location have been increased non-Indian settlement, cattle and sheep grazing, establishment of farms, corporate cattle ranches and road-building. Rock-writing sites have become increasingly more vulnerable because of road accessibility and they need protection.

Elders perceive these processes as having adverse impacts on plants, animal populations, and the quality of the environment in general, especially, the water in Kanab Creek. Too much development could lead to increased risk of flooding. Irrigated farming on a large scale could lead to the drying up of Kanab Creek.

> *I think, people make homes in the area...too many roads too, and that has never been there and I think that's what spoils the scenery and the conditions of the land.*

Recommendations

Paiute people believe they should have the right of free access for seasonal use and harvesting of resources at this location. Currently, permission is required as much of the property is either privately owned or is state and Federal land (e.g., BLM land) that may be leased. According to one elder, property rights, laws, and licenses make it difficult to protect an area such as this. Still, efforts should be made to protect the area. Paiute people would return to hunt, gather plants, and teach younger people about traditional land use practices.

One elder noted that contemporary Indian life is too confined to reservations because there are too many restrictions on land use beyond reservation boundaries. A Kaibab Paiute elder discussed the Bulrush Massacre:

> *I wrote a book once in 1974 about the Bulrush Massacre, which occurred in the Kanab area. The book was entitled "My People". I took the book to the people in Cedar City and made copies of it there. The Mormons poisoned the flour in this area in a place north of Kanab. They poisoned the flour and a person was killed. There have been so many changes because of the roads and all of the ranching.*

Upper Ankati – No Mans Mesa Area

[See Chapter 3 – designated Area G. This area is referred to as VI: 47-52, Springs at the base of Paunsaugunt Plateau. This includes the district known to participants as Ankati (Kelly 1971:16).]

Ankati comprises the area between Kanarimpiku (spring 40) and Kakarimpac (spring 45). Its axis was Kaibab Gulch and the upstream continuation of the gulch, called Wildcat Canyon (Kelly 1971:37).]

Study Area Description

This study area is located within in the Grand Staircase-Escalante National Monument on the north flank of the Grand Canyon. At an elevation of approximatedly 1877 meters above sea level, this area is noted for its Pinyon-juniper plant communities. The study area can be found at 37° 19' 984" N latitude and 112° 03' 394" W longitude within the County of Kane,Utah. The legal location of the interview site is T40S R2W Sec. 28. The interview site presents itself along the west side of a rugged back-country four-wheel-drive dirt road, east of No Mans Mesa and Potter's Butte in the North and West Swag area, and north of Nipple Lake beneath a large shade-bearing two-needled pinyon (*Pinus edulis*). From this location is an excellent vista for viewing Kaivacuwac, Mollies Nipple, (Kelly 1971:15), which is an outstanding 2716-meter mountain with waterless gulches. Kavaicuwac, the prominent erosion formation formerly known as White Cone, (Tabetimp) is an isolated remnant of Navajo sandstone impregnated with iron (Gregory 1951:84). Tabetimp is translated in the Southern Paiute language as 'milk', 'rock', or 'iron' (Shaul and Senarslan 1997:42). The topography descends southward in a succession of terraces that are several miles in width, separated by cliffs that are hundreds of feet wide. The terraces are trenched by deep gorges, and from their floors emerge mesas, platforms and towers with prominent erosional remnants such as No Mans Mesa and Kavaicuwac, Mollies Nipple or Tabetimp, White Cone (Gregory 1951:84).

Dense pinyon-juniper forests cover the higher benchlands in this region and the wider valleys and washes contain Gambel's oak, serviceberry and Ponderosa pine groves. Most of the flora in this location of the Outback Zone is natural vegetation, however in the Nipple Lake region, there is a parcel that is under private ownership. Currently, this gated wetland area remains inaccessible to elders as well as the general population. The area is altered in other ways as well. The practice of chaining has disturbed the vegetation in and surrounding the Nipple Lakes region. Chaining has been used to remove pinyon and juniper prior to reseeding with perennial grasses. Livestock grazing has impacted native vegetation and promoted the

establishment of exotic, invasive species that have become highly successful, particularly in wetland ecosystems.

By contrast, the prominent erosion remnant No Mans Mesa is both remote and solitary. As an outlier of the White Cliffs of Navajo sandstone, it is capped by limestone of the Carmel Formation (Gregory 1951:85). This 2000-acre island encircled by 1000-foot cliffs. It is a pristine plant ecosystem composed of relict grassland and other relict vegetation that have existed since the Pleistocene. This mesa has never been grazed by cattle nor disturbed by agriculture or mining. These ecological communities, including the Pinyon-juniper forests, which cover most of the high elevations grading into Desert shrub in the lower have a low resistance to, and slow recovery from disturbance.

Diverse soils within the Pinyon-juniper communities support trees that are as old as 1400 years. These soil types are critical for sustaining the ecosystems, which are vulnerable to degradation from a number of impacts. Fragile cryptobiotic crusts often referred to as cryptogamic crusts, stabilize the highly erodible desert soils where water sources are scarce. They are responsible for atmospheric nitrogen fixation, nutrient contributions for plants, soil-plant water relations, seedling germination and plant growth and development. These microbiotic crusts, also termed cyanobacterial-lichen soil crusts are composed of lichens, mosses, green algae, microfungi and bacteria bound within a matrix of clay, silt and sand. Living organisms and their by-products form biological soil crusts whereby a surface crust of soil particles is created and bound together by organic materials (Bureau of Land Management 1999:21).

Botanical Interpretation

The slopes within the study area predominantly contain Pinyon pine, Utah juniper, groves of Gambel oak and Big sagebrush. Cheatgrass and other non-native annual brome grasses are threatening native plant communities within the Grand Staircase/Escalante National Monument. These exotic grasses invade roadside ditches and agricultural areas, greatly reducing habitat for native species. In this semi-arid region of red sandstone earth, on the route to the interior, Palmer's penstemon, (*Penstemon palmeri*) a robust perennial (Welsh et al.1993:677) was growing along the roadside beside a pictograph site, which was a large red boulder that was split in two. Kaibab elders informed us that toxo'awatsip, (Palmer's penstemon) was used for aches and pains. The long taproot was chewed and taken internally. The leaves were also applied for healing cuts to prevent scarring. Elders told us that the fruits of squawbush (*Rhus aromatica* var. *trilobata*), are dried and made into a drink, and cradleboards were made from the straight young flexible branches.

At a significant site with a large pinyon pine and smooth sandstone rock outcrops, bastard toadflax (*Comandra umbellata* var. *pallida*), a perennial root parasitic herb in the Sandalwood Family (Santalaceae), was frequently found in association with sagebrush (Kearney and Peebles 1960:226). The elders pointed out that yucca roots were used for shampoo and for keeping the hair black. The stems were used for soap and the leaves provided fiber. The fruits were eaten both fresh and dry (Bye 1972:90). Yucca buds were roasted and baked and eaten, and the seeds were pounded and eaten raw (Bye 1972:91). A Southern Paiute elder discussed the uses of *Yucca,* uus:

Banana yucca shoots and buds are used. The buds are harvested in the fall and dried. It tastes like candy...they are naturally sweet. Yucca leaves and roots are used to wash baskets with... they become real sudsy. You can dry the leaves and tie them in a knot outside.

Paiute plants are listed in bold print along with other plants observed at these locations.

Scientific Name	Common Name
Amelanchier utahensis	**Utah serviceberry**
Artemisia filifolia	**Sand sagebrush**
Artemisia tridentata	**Big sagebrush**
Astragalus sp.	Milkvetch
Bromus tectorum	Cheatgrass
Chrysothamnus nauseosus	**Rubber rabbitbrush**
Cleome lutea	Yellow beeplant
Comandra umbellata* var. *pallida	**Bastard toadflax**
Cryptantha sp.	Cryptanth
Descurainia pinnata	**Pinnate tansy-mustard**
Descurainia sophia	**Flixweed**
Ephedra torreyana	**Torrey's ephedra**
Ephedra viridis	**Indian tea**
Fraxinus anomala	**Singleleaf ash**
Gutierrezia microcephala	**Thread snakeweed**
Juniperus osteosperma	**Utah juniper**
Juniperus scopulorum	**Rocky Mountain juniper**
Nicotiana attenuata	**Coyote tobacco**
Oryzopsis hymenoides	**Indian ricegrass**
Penstemon palmeri	**Palmer's penstemon**
Phoradendron juniperinum	**Juniper mistletoe**
Pinus edulis	**Two-needle pinyon**
Pinus ponderosa	**Ponderosa pine**

Plantago patagonica	Purshes' plantain
Purshia mexicana	**Cliff-rose**
Purshia tridentata	**Bitterbrush**
Quercus gambelii	**Gambel's oak**
Rhus aromatica* var. *trilobata	**Squawbush**
Salsola tragus	Russian-thistle
Sisymbrium altissiimum	**Tumbling mustard**
Sphaeralcea coccinea	**Common globemallow**
Symphoricarpos longiflorus	**Long-flower snowberry**
Verbascum thapsus	Woolly mullein
Yucca angustissima	**Narrow-leaved yucca**
Zigadenus paniculatus	**Foothills death camas**

Southern Paiute Interpretation

According to the Kaibab (Mountain-lying down people) elders who were interviewed during this project, Ankati was a place for hunting deer and rabbit, dry farming, and gathering pine nuts, pine pitch, seeds, fiber, berries and roots. The black seeds of wa'iv (Indian ricegrass) were gathered and consumed. They were harvested by cutting off the tops. The seeds were hulled and parched with charcoal (Kelly 1971:41). Bows were constructed from the oak tree, deer cords were used to make bowstrings and squawbush, su'uv was used for arrows. Kaibab elders noted that rock tanks and springs such as Wildcat Spring, (Sovpac) (Kelly 1971:9), were good cold-water springs. Up canyon from these springs is a rock hole that water came out of, and up north near Tank Canyon is a great rock tank or Poh that has water in it all year long. The rock-writings illustrated the things that people see and the use of Kavaicuwac (Mollies Nipple) as an orientation landmark. One elder remarked:

> I felt humbled by the whole area, humbled in the way I usually feel after a sweat. There's tall sage, when you enter here. It used to be like that in Kaibab. The people used to move around a lot... In the hot seasons, they'd go up to higher elevations. This place is connected to others because of the people... There were a lot of Southern Paiutes, our people who roamed in these areas. They were all over this area. It is a good place for pine nuts and they could gather some yucca and acorns too...Later they'd move to where it was cooler, at a higher elevation...The roads here are on Indian paths.

Features

Water. The waters of Nipple Lake and the springs were used for farming. It was pointed out that this location is currently very dry and that the ranchers are using the water. One Paiute elder reported that this area used to be less dry and there were more plants. Water is considered a precious resource in this region. The Kaibab camped near springs and they used to carry water in a big basket made of willow, kanav covered with pine pitch, sahn-a-pah. A Kaibab elder discussed the springs in the area:

> *My folks had a lot of water with them so they could camp out anyway. They put barrels of water in the wagon. Before that time, they would camp near springs, not next to springs. They used to carry water in a big basket made of willows covered with pine pitch. We traveled to get seeds and to hunt. We knew many places. There are springs and rock tanks – Some springs are alkaline and are not good to drink. Wildcat Spring is good water but not too much. Cottonwood Spring is good water... Up canyon from it is a rock that water comes out of. Up north is a great big rock tank (Poh) that has water in it all year long.*

Plants. The fleshy cones of juniper (wap) were eaten and used for medicine and the seeds were used for making beads. Shampoo was made from the roots of rabbitbrush, (sikump). Yucca, (uus) roots were used for shampoo and for keeping the hair black Its fiber was made into rope and the buds were roasted and consumed. The Paiutes made chewing gum from the rubbery parts of the sagebrush and the crystal pitch of the pinyon pine. Arrows were constructed from the straight branches of serviceberry, (tu-ab) and cradleboards were made from the straight branches of squawbush. The fruits of squawbush (i'is) were dried and used in a drink. Pinyon pine pitch was taken internally for sore throats, colds, and coughs. *Comandra umbellata* var. *pallida,* bastard toadflax fruits were eaten raw, although excessive were knonwn to cause nausea (Bye 1972:95). Yucca, sage, pinyon pine seeds, Indian ricegrass and acorns were collected and utilized in the area.

The great numbers of domestic animals that were brought into the area by settlers, rapidly devoured most of the vegetation, which produced nutritious seeds, on which the Southern Paiutes depended for their subsistence. Cattle soon devastated places for seed gathering (Gregory and Moore 1931:28). A Kaibab Paiute elder commented on impacts to their cultural resources:

> *Squawbush was fenced off from us, and they leveled the ground for cultivation. To us, we have always been environmentalists... We always save things and try not to destroy them. We are entwined in it and have grown up with this. When they blocked off the people from these lands, one of the main things was taken from us. From Kanab, by the foot of the mountains and all the way from Kaibab on through, the white people have occupied these places ...they are padlocked and we cannot get into them.*

Animals. Deer and rabbit were hunted in the area for food, clothing, tools and ceremony. String was made from deer sinew. A Paiute representative noted that the animal habitat is drying up because ranches and cattle are here. A Kaibab elder recommended:

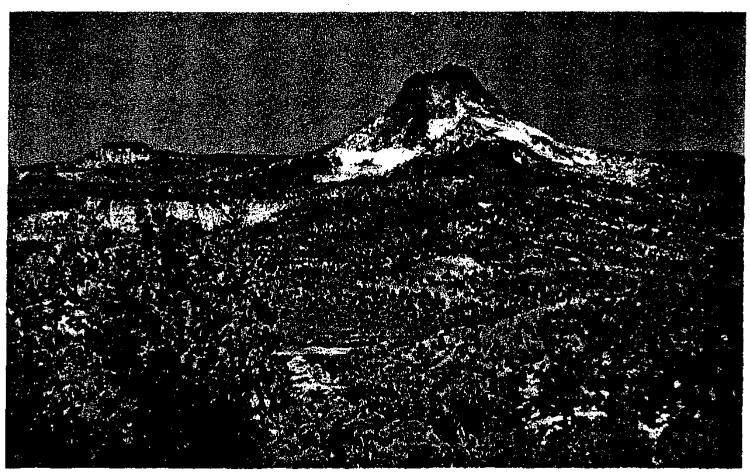
> *Don't put poison on the plants and kill the rabbits.*

Evidence of Previous Paiute Occupation or Use. During this site visit, people observed an Indian granary in a cliff face north of the pictograph site. Elders and researchers also came upon ceramic shards and worked lithic scatters near a large pinyon pine and in the vicinity of the smooth sandstone rock outcrops. A Paiute representative expressed concern over access to this site. She explained that the road affected the condition of these elements. People had vandalized the pictographs by writing over them with graffiti. It is important that these traditional features be protected. A Paiute elder informed us:

> There were Paiute villages in this area. It was one of the main places where they roamed. A lot of the people were born here. My grandma was born in Cannonville, my father was born in Bryce Canyon and his father was born in Henrieville. Grandma was called "Cannonball Sally" because she was a strict and bossy lady...There have been so many changes because of the new roads

and all the ranching. The Indian people traveled these trails because they knew where to go for winter supplies, for the different types of fruit that ripened at different times...they would harvest them for winter use...There were always ceremonial songs.

Geological Features. Standing 2716 meters high, Kavaicuwac, (Mollies Nipple or Tabetimp) is a striking mountain that was reportedly used as a landmark for orientation. There are a number of springs and permanent landmarks with Indian names that were utilized. When the people traveled, they knew where the water sources were, Kaibab elders stated. At the interview site, within the pinyon pine and Utah juniper plant community were striking examples of black slabs of iron in various shapes and unusual formations. A Kaibab elder discussed landmarks: *Landmarkers are permanent features with Indian names. We use them to tell where we are.*



Perceived Impacts

The primary impacts to this area have been increased non-Indian settlement, cattle, sheep and goat grazing, the establishment of ranches and the building of roads. Paiute elders perceived these processes as having adverse effects on the ecosystem and the traditional use features of these locations. Rock-writing sites have been vandalized with graffiti because of their proximity to the roads, which rendered them highly accessible, and therefore vulnerable. Gated, private property within Grand Staircase-Escalante National Monument also creates an obstacle to the continuity of traditional Paiute practices such as the sustainable gathering of wild fruits, seeds, and plant materials used for manufacturing tools, cradles and baskets. Water resources have been depleted and this adversely affects the plants. A Paiute elder discussed this point noting:

It is really dry here. I don't know where the water is going...maybe the ranchers are using it. It used to be less dry. There were more plants. It is drying up here because people are building their ranches and cattle are here.

Recommendations

Paiute people maintain that it is essential that the water sources be protected and that poison not be applied to the plants, which kills the rabbits. It was recommended that hunting be prohibited and that traditional use locations be monitored and safeguarded. In addtion, damage caused by vandalism should be repaired.

It was suggested that keeping people out of significant traditional use areas would reduce their accessibility and hence vulnerability. Paiute people believe that they should have the right of free access for seasonal use and sustainable harvesting of resources in this location. Much of the property is either privately owned or is state and Federal land that may be leased. The elders stated that efforts should be made to protect the area, for keeping these places open to Paiute people for teaching the young about traditional land use practices. As one elder recommended:

Keep it open for my grandchildren.

Ipa – Navajo Well

[See Chapter 3- designated Area D. This area is referred to as 34. Ipa (Old Water; Navajo Well; about 1 mile south of Vermilion Cliffs) (Kelly 1971:9).]

Site Description

This study site is situated approximately 1 mile south of U.S. Route 89 and .5 miles west of Pioneer Gap at 37° 01' 933" N latitude and 112° 16' 101" W longitude. It is 1642 meters above sea level, and is located in Kane County, Utah. Navajo Well, or Ipa which means 'Old Water' in the Paiute language (Kelly 1971:9), is located about 2 miles south of Flag Point in the deep red Moenave Sandstone of the Vermilion Cliffs. The rocks of the Vermilion Cliffs are representative of the Chinle formation of the Triassic age. The hard limestone and sandstones that make up the

Vermilion Cliffs are worn down slowly (Gregory 1963:19). The Ipa - Navajo Well interview site's location is on the southern border of Grand Staircase-Escalante National Monument 1.5 miles west of the old bridge over the dry and deep precipice of White Sage Wash. There are several private ranches, wells and corrals within this locality characterized by sandy soils and water scarcity. Navajo Well has been critically impacted by the mechanical removal of approximately 5-10 yards of earth from the spring. A large mound of earth containing lithics, ceramic shards, petrified wood and historical and current trash is situated beside the spring, which is now a hollowed out muddy ditch covered with an algal bloom, where cattle have left their hoof marks and bees and horseflies find moisture.

Botanical Interpretation

The area is significantly depauperate of native vegetation because of severe overgrazing by cattle and the general mismanagement of resources. In this highly disturbed Sand Desert Shrub plant community with *Juniperus osteosperma,* Utah juniper, spring waters of Navajo Well are utilized for watering cattle. Exotic species such as *Ailanthus altissima,* Tree-of-heaven in the Simaroubaceae or Quassia Family have opportunistically colonized the water source thereby creating a canopy amid an otherwise almost shadeless environment. *Ailanthus* is a malodorous tree with gray bark, large odd-pinnately compound leaves and winged fruits called samaras. Tree-of-heaven was introduced from China and is considered weedy. The samaras are distributed by wind, resulting in thickets surrounding the parent tree (Welsh et al. 1993:687).

Along the confluence of the spring and above, is an extensive sandy bedrock escarpment with embedded petrified wood, which supports populations of crustose lichens, Utah juniper, wap, pricklypear cactus, Four-wing saltbush, several species of sagebrush, rabbitbrush, buckbrush, thistle and other highly successful exotics. Indian tobacco, (tsaw-wap) was observed

growing on the large mound of earth containing lithics, ceramic shards and petrified wood that was removed from Navajo Well.A Kaibab elder indicated that tobacco grew plentifully where it was previously burned. Kelly (1971:46) recorded that tobacco plots were burned in the fall and in the following spring, it grew in abundance. The seeds were not planted and plots were neither watered nor weeded. Tobacco was gathered in the fall; the entire plant was pulled and dried near fire (Kelly 1971:46).

Artemisia filifolia, Sand sagebrush was used in treating swellings and bruises. *Artemisia tridentata*, sah-wahb or Big sagebrush was used as a dye as well as a medicine, which was taken internally as a tea to remedy headaches, colds and worms, and as a stimulant (Bye 1972:93). This useful shrub was also a source of fiber and fuel for the Southern Paiute people.

The fleshy cones of the xeric *Juniperus osteosperma*, Utah juniper were gathered in the winter and spring; crushed and eaten raw (Kelly 1971:43). Some trees produce sweet, fleshy cones while other trees bear strong and resinous ones. Utah juniper increases under grazing and has spread from the thin substrates of ridges and mountain slopes into deeper valley soils (Welsh et al. 1993:28). It has been determined that trees of this species may be older than 1275 years.

Paiute plants are listed in bold print along with other plants that were observed at this location.

Scientific Name	Common Name
Ailanthus altissima	Tree-of-heaven
Aristida purpurea	Purple three-awn
Artemisia filifolia	**Sand sagebrush**
Artemisia tridentata	**Big sagebrush**
Atriplex canescens	**Four-wing saltbush**
Bromus tectorum	Cheatgrass
Chrysothamnus depressus	**Dwarf rabbitbrush**
Chrysothamnus nauseosus	**Rubber rabbitbrush**
Cirsium arvense	Creeping thistle
Cleome lutea	Yellow beeplant
Erodium cicutarium	**Storksbill**
Gutierrezia sarothrae	**Broom snakeweed**
Hordeum jubatum	Foxtail barley
Juniperus osteosperma	**Utah juniper**
Nicotiana attenuata	**Coyote tobacco**
Opuntia polyacantha	**Central pricklypear**
Opuntia erinacea	**Common pricklypear**
Phoradendron juniperinum	**Juniper mistletoe**
Polypogon monspeliensis	Rabbitfoot grass

Purshia tridentata	**Bitterbrush**
Salsola tragus	Russian-thistle
Tedradymia canescens	Gray horsebrush
Tragopogon dubius	Yellow salsify
Verbascum thapsus	Woolly mullein
Xanthium strumarium	Cocklebur

Southern Paiute Interpretation

In the arid environment of the lower elevations, the availability of water was a primary factor in controlling the location of settlements and campsites. A series of springs were found along the base of the Vermilion Cliffs where, intermittently during the year, most of the population was concentrated. Sites were strategically located near water, for hunting and gathering (Kelly 1971:7). A Kaibab elder discussed his work at Navajo Well, Ipa (Old Water) in the 1940's:

> *This is Old Water- We used it all my life. There's a good view from here. It's pretty country, dry country. It's a good place. The deer all come to this place. We used to hunt there. I worked here in the mid-1940's as a cowboy for a rancher who kept his racing horses near here. I slept in his barn, which was located just to the southwest of the spring. I used to haul water for the racehorses at Navajo Spring. We used to cut post up through here and there was an old road to the barn... I haven't been through here in a long time. This spring has been here a long time. It is an old water hole. All year round there was water, like at Wolf Spring. Deer drink from it. It looks like they have mostly drained the spring, so the water is not available for the deer. They have dug up the soil around the spring and drained it into a pond near the corrals. They have fenced the spring from the deer.*

Features

Water. Navajo Well was an important water source for Southern Paiute people. With drinking water at hand, the rolling slopes of juniper provided fuel, the desert flats were nearby for rabbit hunting and seed collecting and the higher plateaus were visited for hunting deer, gathering pinenuts and yucca fruit (Kelly 1971:7). Owl Eye reportedly owned Navajo Well (Kelly 1971:14). Occupants of nearby watering places shared the same seasonal cycle, thus forming local groups that were primarily economic in character (Kelly 1971:8). Kaibab elders discussed Southern Paiute sustainable practices of spring management:

> *Different families took care of each spring so they were always well cared for. There was always a cup there for people to drink from. Now, this spring suffers from neglect. The area has become overrun by people and their animals... and*

> *that has destroyed it. It looks like they tried to develop the spring and dug it out with a backhoe.*

Plants. Settlement, cattle grazing, and other poor land-use practices have had a negative effect on this significant archaeological site. The degradation of the native plant communities and the consequent reduction of palatable herbs and shrubs have been severe. A Southern Paiute elder spoke about the significance of the plants in the area:

> *Grandma said that if you see a great big squirrel nest, you can know where the good places are to get your good pine nuts...Indian people give offerings wherever they go, even if they stop for lunch. Maybe the Indian tobacco here was one of the offerings they gave and it kept on growing. Every site where Indian tobacco was found...maybe that was an offering.*

Animals. An Ord's kangaroo rat, *Dipodomys ordii* was observed near a crevice at the foot of a shelf-like rock projection within the eroded bedrock foundation of the site, where small Utah juniper trees dot the gentle slope. A Kaibab elder discussed the animals that are native to the area:

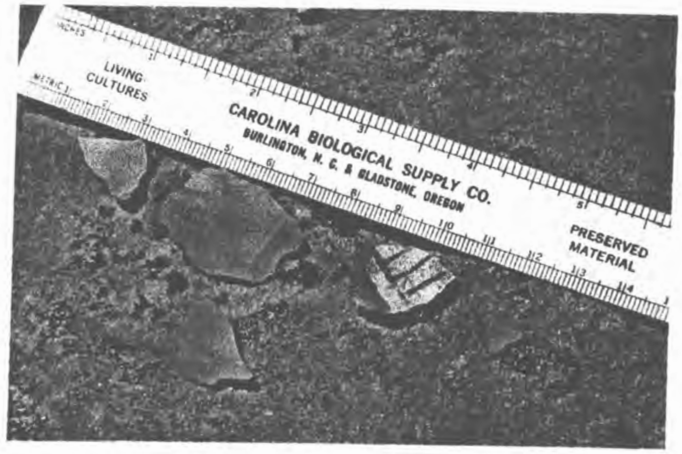
> *There are antelope, deer and a few elk within the area...now people are building everywhere so it pushes the animal to get killed on the road.*

Evidence of Previous Paiute Occupation or Use:

Grayware, redware, Kanab black-on-white, and back-on-black ceramic shards with distinctive markings were found at Ipa. A number of places with significant lithic scatters were observed at this site, which has been severely picked over by arrowhead hunters. However, there is virtually no stratigraphy of materials because of disturbance due to earth removal at the spring and in other locations. Within this area some cut trees and burn scars on rocks were also noted.

Black-on-black pottery shards and an old chipping station appear to be the site of a camp. Beside it was a collection pile from an arrowhead hunter. Beyond the dirt road from Pioneer Gap is the location of an old camp. Interspersed with Utah junipers, some black-on-white pottery and black-on-black pottery shards were found. A Kaibab elder commented on evidence of previous Paiute occupation at Ipa:

There are signs of the old people here. There were arrowheads but we are not allowed to pick them though . . *People come out and pick them up. These potteries and rock chippings show that my folks lived here for a long time.*



Physical/Geological Features. Navajo Well, Ipa is approximately 2 miles south of the Vermilion Cliffs of the Moenave and Kayenta Formations of the Jurassic. Powell noted the brightly banded wall composed of orange and vermilion sandstones along the south face of Moccasin Terrace. He enjoyed seeing the morning sun shining on "their painted faces; the salient angles on fire" (Gregory 1950:21). The distinctive formations of the Vermillion Cliffs continue to hold significance for contemporary tribal members. Elders talked about the landscape and how the people traveled the trails for winter and summer camps within the area:

The pretty red hills...In the wintertime when the sun goes down, it brings out the red. It's beautiful in the fall. I remember when I came up in summertimes to stay with my grandma. Our people gathered seeds, prickly pear fruit, Indian tobacco, pine nuts and hunted deer and rabbit in this area. My grandma used to come up here to the red hills and pick pine nuts. Grandpa would tell about traveling and stopping in certain areas from Kaibab to Cedar. Older people used to travel here. Before the ranchers came, it was different.

Perceived Impacts

The major impacts to Ipa include the destruction of the spring, overgrazing, unsustainable land use, removal of archaeological materials and disturbance to the Indian camps sites in the area. Kaibab elders discussed these impacts:

They drained the water from the spring and dug up the dirt and fenced the spring from the deer. The area is overrun by people. Cows and horses destroyed the site but it is by man. People and roads are affecting the plants. They plowed a lot of the site and its artifacts, and destroyed it. Man destroys a lot of stuff. All of these places are closed to Indian people.

Recommendation

Kaibab elders wish to have continued access to places within their traditional cultural landscape. They made recommendations for protecting this significant site:

> *Keeping the animals out of the area would improve it for one. If they cleaned the spring up, the water could be used again for drinking. Indian people would come here if they were allowed to and protect this site and clean it up. Don't just let it go...not let animals and people run over the plants, not let cars run over them...Not let people pick up the artifacts. Put back the dirt and take down the fences by the spring. Give the water back to the deer. We say when you are picking stuff, always give back something. Give offering. When we go camping, we stop and give an offering.*

Tupac (Black Water) - Seaman Spring

[See Chapter 3 –Area F: Watering Places along the Vermilion Cliffs, Wildcat Canyon, and Kaibab Gulch (V:35-46). Tupac (Black Water; about 3 miles east of Ipa (Old Water; Navajo Well: about 1 mile south of Vermilion Cliffs). This includes the district known to informants as Ankati (Kelly 1971:16).]

Site Description

Tupac, Black Water or Seaman Spring is located approximately 7 miles northeast of Ipa, Navajo Well at 37° 06' 960" N latitude and 112° 15' 004" W longitude, 2050 meters above sea level at the base of the Vermilion Cliffs, 8 miles north of Pioneer Gap. The two springs are culturally connected and in many respects the same place.

The interview site at Tupac is less than 1 mile north of Seaman Point and 6 miles north of U.S. Route 89 by dirt road to Seaman Wash. Tupac is a one of the small canyons that dissects the bright red sandstone scarp of the Vermillion Cliffs. The deep red Moenave Sandstone, with banded red, gray and white Chinle badlands at their base add to the beauty of this striking geological feature. Clarence E. Dutton described this massive south-facing rock face in 1881:

> *To this great wall, terminating the Triassic terrace and stretching from the Hurricane Ledge to the Paria, Powell has given the name of the Vermilion Cliffs. Their great altitude, the remarkable length of their line of frontage, the persistence with which their proportions are sustained throughout the entire interval, their ornate sculpture and rich coloring, might justify very exalted language of description...The Vermilion Cliffs send off buttes...and giant buttes they verily are, rearing their unassailable summits into the domain of the clouds, rich with the aspiring forms of Gothic type, and flinging back in red and purple the intense sunlight poured over them. Could the imagination blanch those colors, it might compare them with vast icebergs, rent from the front of a glacier and floating majestically out to sea...Beyond and in the far distance rise these towering fronts, ablaze with red light from the sinking sun. To the eastward they stretch into illimitable distance, growing paler but more refined in color until the last visible promontory seems to merge its purple into the azure of the evening sky...*(Dutton 1882:54).

Springs are found in an almost continuous line along the base of the Vermilion Cliffs. Intermittently during the year, it was at these sites that most of the Kaibab population was concentrated. Spring water was available, junipers provided fuel, and the desert flats were near for rabbit and deer hunting and seed gathering. The highland terraces were for deer hunting, pine nut collecting and the gathering of yucca fruit. Watering places such as the springs in the Vermilion Cliffs were the controlling factor in the location of Kaibab Paiute settlements (Kelly 1971:7). Fresh water springs and seeps bubbling from the Navajo sandstone of the Vermilion Cliffs have provided potable drinking water for the Southern Paiute Indians for centuries. About three-fourths of the springs and seeps within the Paria Canyon-Vermilion Cliffs Wilderness, are in the Vermilion Cliffs. The springs below the Vermilion Cliffs are in poor condition as a consequence of development for livestock use or domestic water (U.S. Department of the Interior 1986:13).

Tupac, in Seaman Canyon contains a rich diversity of biological, archaeological and geological features. This area has a long history of Southern Paiute habitation. Prehistoric and historic trails traverse the canyon, Indian camps sites and other cultural properties attest to the value of the spring as an important water source for American Indian people. Tupac has significant wildlife habitat within a dynamic riparian ecosystem. Historic yearlong livestock grazing within the canyon has altered the native vegetation, which is now recovering after stock removal. Tupac, Seaman Spring was drained to provide water for the aqueduct and for stock tanks below Seaman Canyon. In other wetland ecosystem within the Paria Canyon-Vermilion Cliffs Wilderness, overgrazing has allegedly caused the loss of an entire age structure of cottonwood trees within the riparian communities in lower Paria Canyon. The revised grazing system of the Bureau of Land Management is designed to promote and support the establishment of new cottonwoods and the restoration of the riparian ecosystem within impacted areas (U.S. Department of the Interior 1986:14).

Botanical Interpretation

Along the dirt road to Seaman Spring, within a moist depression are viable stands of young Coyote willow, kanav (*Salix exigua*) within a recovering riparian community. Kaibab elders were pleased to see this culturally significant plant, a source of valuable weaving material for basket making. Tamarisk (*Tamarix chinensis*) is competing with the native willows for the

scarce water resources within the canyon. This highly aggressive and successful species has become naturalized along seeps, springs and waterways. It reached southern Utah by the turn of the century and by the 1920's it became well established along the Colorado River and its tributaries. Tamarisk occupies many of the lacustrine and riparian habitats of southern Utah and there is little hope of eradicating it (Welsh et al. 1993:694). Palmer's penstemon, toxo'awatsip (*Penstemon palmeri*) was observed along the dry bank of the road in decomposed red Navajo sandstone soil. Kaibab elders discussed its use, as a medicine for aches and pains. The handsome perennial, Blue flax (*Linum perenne*) was growing along the roadside beside Palmer's penstemon. It resembles the cultivated flax, an annual, which is the source of quality fibers and linseed oil. It is stated that the Indians of some of the Western states used the long fibers of the slender stems of Blue flax for making cordage (Kearney and Peebles 1960:489). Rubber rabbitbrush (*Chrysothamnus nauseosus*), sikomp was observed growing on the roadside and elders noted that the roots were used as a source of shampoo.

The deciduous Gambel's oak (*Quercus gambelii*), tuav or kwiav form arborescent thickets along the road to Seaman spring, and provide forage for deer within the canyon. The Southern Paiutes gathered acorns of Gambel's oak in the fall, when they turned black and ripened. They were shelled and roasted in ashes, and brushed with leaves to remove the ashes (Kelly 1971:44). The exotic robust biennial, Woolly mullein (*Verbascum thapsus*) was seen growing in an open site in disturbed soil along the road near the spring. Its presence is an indication of unnatural impact to an ecosystem such as earth removal, grazing or road building. The xeric and unusual Singleleaf ash (*Fraxinus anomala*) was growing in decomposed sandstone in this red rock canyon. This small tree species was an important fuel for the Southern Paiutes in their winter camps (Kelly 1971:150). Silver buffaloberry (*Shepherdia argentea*), a shrub that is often found associated with water, was growing on the sandy slopes of Seaman Canyon. The red fruits were eaten fresh, dried and ground by Southern Paiute people (Kelly 1971:153).

A Kaibab elder stated that Utah serviceberry (*Amelanchier utahensis*), tu-ab branches were used for making arrows. Digging sticks were made from the wood of serviceberry. The butt of the branch was placed within hot ashes to soften it and it was bent and tied with buckskin. The point of the stick was sharpened with a stone knife to fire harden it (Kelly 1971:154). The fruits were dried and ground on a metate, and the pulp was stirred into water and drunk (Kelly 1971:42). Broad-leaved cattail (*Typha latifolia*), to-oiv was growing in the slow-moving water of the spring. In summer, Southern Paiutes ate the nutritious root of cattail and the brown spikes or seed heads were also consumed (Kelly 1971:46). Paiute plants found in this location are listed in bold print below along with other plants observed at this site.

Scientific Name	Common Name
Amelanchier utahensis	**Utah serviceberry**
Artemisia filifolia	**Sand sagebrush**
Artemisia tridentata	**Big sagebrush**
Bromus tectorum	Cheatgrass
Castilleja sp.	Indian paintbrush
Chrysothamnus nauseosus	**Rubber rabbitbrush**
Chrysothamnus viscidiflorus	**Viscid rabbitbrush**
Cirsium arizonicum	**Arizona thistle**
Clematis ligusticifolia	**White virgins-bower**
Elaeagnus angustifolia	Russian olive
Fraxinus anomala	**Singleleaf ash**
Hordeum jubatum	Foxtail barley
Juncus longistylis	**Longstyle rush**
Juniperus osteosperma	**Utah juniper**
Juniperus scopulorum	**Rocky Mountain juniper**
Melilotus officinalis	Yellow sweet-clover
Oryzopsis hymenoides	**Indian ricegrass**
Penstemon eatonii	**Eaton's penstemon**
Penstemon palmeri	**Palmer's penstemon**
Pinus edulis	**Two-needle pinyon**
Polypogon monspeliensis	Rabbitfoot grass
Polypogon viridis	Water polypogon
Populus fremontii	**Fremont's cottonwood**
Purshia mexicana	**Cliff-rose**
Purshia tridentata	**Bitterbrush**
Quercus gambelii	**Gambel's oak**
Ranunculus sp.	Buttercup
Rhus aromatica* var. *trilobata	**Squawbush**
Ribes sp.	**Gooseberry**
Salix exigua	**Coyote willow**
Scirpus pungens	**Common threesquare**
Shepherdia argentea	**Silver buffaloberry**
Swertia albomarginata	White-margined swertia
Tamarix chinensis	**Tamarisk**
Typha latifolia	**Broad-leaved cattail**
Verbascum thapsus	Woolly mullein
Yucca angustissima	**Narrow-leaved yucca**

Southern Paiute Interpretation

Southern Paiute people traditionally used Tupac, Black water, as well as the other springs along the Vermilion Cliffs. These valuable water sources within a semiarid environment were important settlement places for the Kaibab, (Mountain lying down people). A number of canyons with springs and seeps dissect the Vermilion Cliffs in Grand Staircase-Escalante National Monument, within the study area. There were Southern Paiute winter and spring camps at the foot of the cliffs, often at Tupac, and there was a directed seasonal movement of camps, moving in unison. Food was cached in caves within the Vermilion Cliffs for winter, and fall was a time for gathering pinyon seeds on top of the cliffs. In summer the people moved up canyons toward the White Cliffs where they gathered various seeds such as aki, tansy mustard (*Descurainia*), pasi, wormwood and sagebrush species (*Artemisia*), ciciganti, balsamroot (*Balsamorhiza*) and on top of the cliffs, sigo'o, (Kelly 1971:16) Sego lily bulbs (*Calochortus nuttallii*).

Features

The spring, numerous plants, animals, trails and geological features were identified as being traditionally used by Kaibab people. The elders were pleased to see the hydrological system of the canyon and its vital plant resources recovering, after stock removal. A large overhanging ledge beside the spring served as a shaded place for resting. Up canyon from the spring were large boulders and rocky outcrops, which support such plants as the robust perennial and scarlet-flowered Eaton's penstemon (*Penstemon eatonii*), the trailing woody vine, White virgins-bower (*Clematis ligusticifolia*) and the carmine-flowered Arizona thistle (*Cirsium arizonicum*).

Water. Southern Paiute people used Tupac, like many other springs in the Vermilion Cliffs. Here they set up camps that were permanently used upon their seasonal migration through the area. One Kaibab elder commented:

> *There is something like this at Sand Wash. Follow it up and you come to a place with willows and lots of water. It's good water to drink...Just like Kaibab water- It's good water. Cattle have been drinking in the water here. The animals drink here too. They go a long ways to drink water.*

Plants. Narrow-leaved yucca (*Yucca angustissima*) with its deeply constricted capsules was growing in the decomposed red sandstone by the roadside, within the canyon. Indian people

used this important plant as a source of fiber for cordage and textiles (Welsh et al. 1993:737). Southern Paiute people are committed to protecting their cultural and natural resources within Grand Staircase-Escalante National Monument. Elders expressed great interest in the sustainable harvesting of traditional plant materials and the conservation and management of the wetland ecosystem, which supports many culturally significant plants that are used by Southern Paiute people. They would like to continue utilizing these plant species as their grandparents taught them. Continued access to the places where their people lived and traveled within their cultural landscape is highly valued by the Southern Paiutes. They wish to share these places with the young, to pass on this intergenerational knowledge to their grandchildren. A Kaibab elder spoke about how her mother prepared the willow for use as a weaving material and how her grandma used su-uv, squawbush:

> *The antlers of the deer were hollowed out and used to scrape the willows... to thin them. The willows are used to make cradleboards. My grandma wove baskets with su-uv, and squawbush berries make really good punch, i'isi punch.*

A Kaibab elder discussed Paiute plant medicine:

> *A long time ago, the people never got sick. They lived a long time and they didn't have no doctor to go to. They used Indian medicine, like sagebrush for colds. They'd smash it down... and it was good for the little kids during the night inside the cradleboard. I've used Indian medicine a lot of times.*

Elders expressed concern about impact to the native vegetation by livestock, within the area. A Kaibab elder who was interviewed commented on the abundance of Foxtail barley (*Hordeum jubatum*) growing in the canyon. He informed us that cows and deer don't eat this native plant that moves into disturbed areas in the manner of an introduced weed. Mature fruiting heads cause injury to eyes and mouthparts of all grazing animals (Welsh et al. 1993:834). This

aggressive weed pierces mouths and nostrils and gets into the wool, causing sores when they penetrate the skin (Kearney and Peebles 1960:96).

Animals. One of the project participants found a dead Little Brown Myotis bat (*Myotis lucifugus*) by the road near the spring. A Northern Plateau Lizard (*Scleropus undulatus elongatus*) was seen perched upon a large boulder on the edge of the spring within the study area. This reptile seeks shelter under rocks and eats insects, spiders, ticks, millipedes, snails and small lizards (Stebbins 1985:132). A Wandering Garter Snake (*Thamnophis elegans vagrans*) was observed moving swiftly through the meadow alongside the spring in the shade beneath the rock ledge. This species is often found in damp environments near water. When frightened, they tend to seek shelter in dense plant growth or they usually enter water. This snake eats snails, slugs, leeches, frogs, toads, tadpoles, lizards, snakes, small mammals, some birds, insects and carrion (Stebbins 1985:201). Within the moist but almost waterless mud below the spring, numerous Canyon treefrog (*Hyla arenicolor*) tadpoles struggled for existence in the dewatered environment. Several adult Canyon treefrogs were seen in the spring with the tadpoles and around the periphery of the water. Several Black Swallowtail butterflies were sited within the canyon by the water. Kaibab elders discussed this creature:

> *Don't chase the butterflies. My grandmother always told us not to follow them. There is an old saying about the butterfly... Don't ever follow them or they will lead you to the rattlesnake. There are a lot of butterflies at Kaibab.*

The Kaibab elders who were interviewed stated that Southern Paiutes hunted in the area:

> *They used to hunt deer, antelope, jackrabbits and squirrels long ago in the area. They killed them with bow and arrows. It's hard to break. Go up the mountain... They used oak as a bow. From out of the deer, they used the sinew as a bowstring. My grandpa used this kind... He found feathers for the bow and arrow. The deer would go on the mountain.*

A Kaibab elder informed us that there were Bear Dance Songs, hunting songs and other ceremonial songs performed in the area. The Bear Dance Song took place after the bear came out of hibernation in the spring. When the people were going out to hunt, they used to sing. There were ceremonies conducted all over the area.

Evidence of Previous Paiute Occupation/Use: Lithics, pottery shards and stone chippings were found in the canyon near the spring, and on the rim of the canyon were large lithic scatters of various ceramic types. Tupac and Seaman Canyon within the Vermilion Cliffs is a place that is rich in Paiute history. The people farmed by the creeks and washes, had meetings and played hand games in the area. Kaibab elders who were interviewed discussed the seasonal transhumant strategy of the Southern Paiutes:

> *They were always on the move. They knew where they were going. Even at nighttime, they had the stars to guide them and they stayed to the same trails. They never had a permanent residence, so they would stop on the way to wherever they were going because of the water and the plants, for hunting and gathering food. I think that all of the Indian tribes did a lot of hunting, exchange and trade and were involved in social gatherings... They gave songs when they traveled. There were social dances like the Round Dance and the Bear Dance. They had a lot of those dances wherever they went. We used to go picking pine nuts on Kaibab Mountain with my grandma. There are a lot of springs along this area where people stopped on their hunting, medicinal gathering and living. They've been here a long time. People from here were mostly from Kaibab. Captain George was my Uncle's Dad.*

Physical/Geological Features. The mountains, rock formations and the spring are important in ceremony for Southern Paiute people. There are ceremonies and ceremonial songs associated with this locality. Elders spoke about how this place is connected to other areas within the Southern Paiute cultural landscape:

> *There were ceremonial songs in this area such as the Salt Song and the Bird Song from the Mohave Valley. The Salt Song helps the person who died, to help them*

across to get to where they need to go and each one of those songs tells a story. They sing the songs for everybody. It just helps their spirits in their travels wherever they're going. When Aunt Yetta was alive, she went down the Colorado River... She said there are some places that I want you to see... Yetta said she would show me the spiritual places that she wanted me to see.

A Kaibab elder explained the Southern Paiute place names in the region and their significance:

Paria is Pawtuhee – Elk Water
Kaiparowits is OawKaidooweep - Mountain Sun
Yellow Canyon is Waweep
The red, white and orange of the earth are for medicines, for prayers.
Bryce Canyon is Awvo'uv – Semi-Circle
Panguitch is Pawguh uts – fish
Skutumpah in Johnson Canyon is Rabbitbrush Water
Cedar Breaks is Ungkaw Pekonump – Red Cove
By Cedar mountain is Brian head, which is Too-Kweeckoovunt – Black Peak
Kanab is Kanav – Willow
Navajo Mountain was formerly called Paiute Mountain before the Navajos came. There are Paiute farms up by Paiute Mountain. They farmed corn, squash and watermelon.

Perceived Impacts

The development of roads, livestock grazing and the draining of the spring have significantly altered this site. There is a history of livestock grazing and ranching including cattle, horses and sheep, as an extensive open range within the area. The plant communities have been severely impacted by these activities. In the past, Southern Paiute people sustainably managed the plants and the water resources within this locality. Plants such as squawbush and willows benefit from selective pruning to encourage strong, resilient branch growth the

following season. Basket and cradleboard makers understand the necessity of sustainable pruning methods. The discontinuity of American Indian resource management in this area is notable. The lack of access to their ancestral lands has been a detriment to the environment and to the cultural longevity and integrity of the Southern Paiute Indian Nation. Water is highly regarded and treated with reverence and respect by Southern Paiute people. They recognize that wild animals are dependent on the springs for survival in this semiarid environment. A Kaibab representative explained:

> *All the things we didn't have as kids...we want to give this to our children.*

Recommendations

Southern Paiute people wish to have continued access to their traditional places within Grand Staircase-Escalante National Monument. As natural and cultural resource consultants and managers, Southern Paiute people possess a vast and significant traditional knowledge and understanding of the region. Because of their spiritual ties to the area, their practical and wise conservation ethic and expertise bespeak their love and respect for the land. As an integral part of this locality, which is within their ancestral cultural landscape, Southern Paiute people are a valuable asset to the Grand Staircase-Escalante National Monument. Kaibab representatives expressed:

> *Southern Paiute people want to come to the area...to know that we were here before...Beside knowing where they are from and that they were here...Our people need to know...The place needs to be more accessible. If we were allowed, we would come here and protect the spring and the plants...*

Chapter 5

Cultural Landscape Responses

This chapter presents opinions expressed by Indian people regarding the relationship of the GSE/NM area to places and cultural resources found in the surrounding region. This is a direct effort to explain the centrality of the GSE/NM area, which is being discussed as a cultural ecoscape, within increasingly larger cultural landscapes such as a *regional landscape*, a *storyscape,* and a *holy land.* These concepts are first defined and described in a model and theory of cultural landscapes, and operationalized in American Indian terms for the GSE/NM ecoscape. This chapter concludes with a discussion of places specially mentioned as part of these American Indian cultural landscapes and an ethnographic summary of the findings.

Within the model of American Indian cultural landscapes discussed below and used to frame the analysis of this chapter, it is possible for specific places to be a part of one or more types of cultural landscapes. Any place can be connected to other places through the occupation and use of a common geophysical space such as a watershed. This type of relationship is being termed an *ecoscape* cultural landscape. Any place may also be connected to other places through larger direct connections, thus making it an integral portion of a *regional* cultural landscape. Finally, any place can be connected with other places by being a part of a *storyscape* or an *eventscape*.

This chapter is based on data from a cultural landscape interview instrument that provides each Indian person being interviewed the opportunity to discuss whether or not the GSE/NM area is connected in any way with larger cultural landscapes.

American Indian Cultural Landscapes: Technical Term #2: Cultural Landscape

American Indian people typically want to provide the fullest protection possible for their cultural resources found beyond the bounds of tribal reservations. Federal and state land managers also want to protect these cultural resources, thus complying with relevant and related laws. Since the mid-1970s, when Indian concerns began to be formally incorporated into cultural studies, there has been a major gap between what Indian people want to protect and how much protection managers of nonreserved land are willing and able to provide. In general, Indian people desire *holistic conservation,* which means, "these are our lands, even if others control them, and we wish no further development or damage to occur here" (Stoffle and Evans 1990). Unfortunately, from an Indian perspective, few land managers are able to follow this expressed desire. Often federal and state lands are required by law to permit and even encourage development and open public access to the land. When development cannot be eliminated, Indian people are faced with a forced-choice situation; they can either recommend certain places for protection or withdraw from participation and have projects proceed without their input. This forced-choice decision results in what has been called *cultural triage* (Stoffle and Evans 1990);

that is, making a recommendation to protect some cultural resources or areas before others. Cultural triage places in the hands of Indian people the right to choose what to protect first and to make this choice based on their own criteria. Today, many Indian people and tribes have selected places for special protection, and land managers have used these recommendations to minimize adverse impacts to these cultural resources.

A number of scientific procedures have been developed to help translate the cultural concerns of Indian people so that land managers can make culturally appropriate decisions. One such procedure is *calculating the cultural significance* of Indian plants, animals, and artifacts and using these numeric values to select places having the highest values for protection (Stoffle, Halmo, Evans, and Olmsted 1990). Calculating values for cultural resources and the places they reside does not replace Indian styles of expression, but it is instead a parallel approach to the common goal of providing maximum cultural resource protection to the most culturally significant resources and places.

Cultural resource protection laws are another driving force behind the need to triage cultural resources and the places where they occur. Historically, these laws have begun with the premise that some things and places are more important than others are, and only the most significant places should be afforded protection. Once this premise is established, then determining the criteria for assigning significance logically follows. In general, significance derives from some obvious value to the society at large or to science. Initially, these laws were focused on protecting single properties such as a house or a historic site. The laws eventually were broadened to protect archaeological or historical districts composed of multiple properties.

Most recently, the concept of *traditional cultural property* (TCP) has been offered as a tool for identifying and protecting places and objects that have special cultural significance to American Indian or other U.S. ethnic groups (Parker and King 1990). The TCP concept is a logical extension of the NHPA, which was initially designed to protect individual buildings and historic objects. Although the TCP concept has been effective in protecting small places of extreme cultural significance, Indian people and scholars alike have questioned whether or not TCP is the best way to conceptualize and protect geographically larger American Indian cultural resources.

We maintain that American Indian perceptions of land and its resources can be represented as *cultural landscapes*, which are culturally and geographically unique areas. American Indian cultural resources (plants, animals, artifacts, minerals, air, and water) tend to be viewed by scientists and land managers according to inherent criteria defined by Western scientific concepts. Western scientists tend to study plants, animals, archaeology, and rock art without reference to other cultural resources found in the area under study. This isolation of cultural resources by their perceived inherent characteristics has the advantage of providing an information-rich discussion about a single type of cultural resource. For example, a complete study of plants significant to Native Americans is conducted and documented in a separate report that includes specific recommendations for protecting plants. Most Federal preservation laws address a single type of cultural resource, and this piecemeal-approach procedure is useful to managers because it provides recommendations for resource management and preservation according to the predefined resource types. Despite the legal basis for and widespread use of

resource-specific studies, these procedures for classifying and managing American Indian cultural resources do not fit and in some cases are quite meaningless in terms of how many American Indian people view cultural resources.

To illustrate this cross-cultural reality, Southern Paiute people tend to view cultural resources as being bound together in broad categories based on functional interdependency and proximity rather than being defined by inherent resource characteristics. Most places where Indian people lived and visited contained the diverse necessities of life: plants and animals for food, medicinal plants for continued health; paintings and peckings on rock walls telling about historic events and blessing the area where the people gathered; and water to drink and use in ceremonies of all kinds. Indian people perceive places and the things associated with them as interrelated. For example, some archaeological sites were plant-gathering areas, and some animals appear in rock paintings and peckings that depict the relationship between Indian people and animals.

The key question that confronts Indian people, the scientists assisting them with cultural resource studies, and agencies that must use the information to make land use policies is, "How can we best conceptualize Native American cultural resources?" Indian people contribute to resource-specific studies because they recognize that doing so has been the best way to protect the resource in a given cultural resource assessment situation. On the other hand, Indian people desire to reassemble the artificially disassociated components of their culture so that the fullest native cultural meanings associated with things and places are recognized and protected.

The idea that American Indian cultural resources can be viewed, evaluated, and protected in new categories is more than repackaging. Employing a holistic analytical perspective is an attempt to seek to understand culturally distinct understandings of environment, history, and place. There is a growing scientific literature that demonstrates the importance of different culturally derived understandings of the environment. Greider's (1993:79) analysis demonstrated that one Native American medicine woman transforms the same plants into Indian and non-Indian medicine, each requiring different culturally expected practices for the medicine to be effective. Winthrop (1994:27-28) explained disputes over where to include Indian concerns in the EIS of a proposed ski area by contrasting a U.S. regulatory agency definition of nature as a *wilderness* lacking humans, with an American Indian definition of nature as *oikumene* or inhabited world. The Indian people involved in the ski assessment believed that their cultural concerns belonged in all sections of the report and should not be restricted to a human impact section. Howell (1994:130-131) pointed out that the conquerors' conceptual removal of native peoples from the natural environment has had adverse impacts on how effectively U.S. national parks have been managed. Consequently, a reconceptualization of nature as human ecology is essential before realistic ecosystem management can occur. Treitler (1994:22-23) suggested that three Indian tribes have chosen different strategies for interacting with a federal environmental regulatory agency based on their differing cultural perceptions of the environment and the implications of sharing sacred information about the natural landscape being studied. Greider and Garkovitch (1994:8) concluded that:

> Cultural groups socially construct landscapes as reflections of themselves. In the process, the social, cultural, and natural environments are meshed and become

part of the shared symbols and beliefs of members of the groups. Thus the natural environment and changes in it take on different meanings depending on the social and cultural symbols affiliated with it.

Kelley and Francis' (1993) research with Navajo people suggested that the latter view places as a part of larger landscapes and that it is ethically wrong to refuse to adopt the culturally appropriate categories that people use in their understandings of the environment. According to Kelley and Francis (1994:101), even the Navajo Nation's Historic Preservation Department (HPD), when forced to do so by Federal laws, uses a *piecemeal* approach instead of the culturally appropriate *landscape* approach of its own people. The Navajo HPD argues (Downer et al. 1994), however, that the HPD is working within U.S. Federal regulations while attempting to broaden overly constraining concepts such as *history* so that data derived from what is called *traditional history* can be used in the preservation of culturally important places.

Land management agencies manage places. If there are objects, plants, or animals to be protected, the place where the objects are located, the plants grow, or the animals live is assigned special status. Sometimes the place is the cultural resource, and thus it is termed a *traditional cultural property* (Parker and King 1990). In most instances, however, the place is set aside to protect the cultural resources it contains. Given the reality of contemporary land management practice in the U.S, cultural resources ultimately must be studied and managed as geographically coherent units. A key question is "how big do these geographically coherent units have to be to afford acceptable protection to the cultural resources they contain?"

Both Native Americans and scholars of Native culture propose a number of terms to discuss these geographically coherent units: *sacred geography* (Walker 1991), *spiritual geography* (Griffith 1992) *sacred landscapes* (Carmichael 1994), *symbolic landscapes* (Grieder 1993) and *cultural landscapes* (Kelley and Francis 1993, 1994; NPS 1994). Each of these terms convey similar key elements of what Native peoples often express when they talk about their traditional conceptualization of a holistic view of the land and its cultural resources (Stoffle and Evans 1990).

We chose not to use the terms *sacred* and *spiritual* here, even though these labels reflect the intensity of attachment Indian people have for their landscapes. Unfortunately, the terms *sacred* and *spiritual* imply in Western epistemology the concept *secular*, thus limiting cultural resource discussions to what non-Indians perceive to be strictly religious activities. Religious terms are appropriate if a study is only about ceremonial resources, but usually the terms *sacred* and *spiritual* cause many Indian cultural resource concerns to be eliminated from the discussion of landscapes.

The term *symbolic* was not selected for use in this essay because it is not commonly understood, and thus requires technical explication before being useful. Actually, the term *symbolic* does reflect how landscapes are created by humans and why it is so difficult to find common terms to discuss them. Greider and Garkovich (1994:6), who have a theoretical discussion of how landscapes are created, conclude that human beings, in essence "...construct a landscape from nature and the environment through culturally meaningful symbols and then reif(y) it." Thus, any specific landscape exists and lives only in the minds of social groups.

Competing views develop when more than one social group occupies or otherwise has some reason to establish a cultural perception of a landscape. When developmental changes to the landscape are discussed, the assessment of these changes will be affected by which symbolic landscape is being considered. The consequences of planned environmental change can only be understood with reference to a people and their symbolic construction of the landscape.

The term *cultural landscape* is meaningful because it is widely understood without further explanation and has official standing in a number of U.S. Federal laws, regulations, and guidelines. Perhaps the most detailed federal policy statement on cultural landscapes appears in the National Park Service *Cultural Resource Management Guidelines* (NPS 1994). There, the agency defines *cultural landscapes* as complex resources that range from rural tracts to formal gardens (NPS 1994:93). The natural features such as landforms, soils, and vegetation provide the framework within which the cultural landscape evolves. In its broadest sense, a cultural landscape is a reflection of human adaptation to and use of natural resources. A cultural landscape is defined by the way the land is organized and divided, settled and used. In addition, the types of structures that are built in a place play an important role in defining a landscape.

The NPS stipulates that a *cultural landscape* is a geographic area, including both natural and cultural resources, associated with a historic event, activity, or person (NPS 1994:94). Using these criteria, the NPS recognizes four cultural landscape categories: (1) *historic designed landscapes,* which are deliberate artistic creations reflecting recognized styles; (2) *historic vernacular landscapes,* which illustrate peoples' values and attitudes toward the land and reflect patterns of settlement, use, and development over time; (3) *historic sites,* which are important for their associations with important events, activities, and persons; and (4) *ethnographic landscapes,* which are associated with contemporary groups and typically are used or valued in traditional ways. Rural historic landscapes are discussed in Bulletin 30 (McClellan et al. 1990).

The NPS definition of cultural landscapes is both similar and dissimilar to definitions often expressed by Native Americans. Both definitions include the land, its natural components, places touched by prehuman spiritual beings, and objects left there by Indian people as these are conceived within the cultural system of the people. Both conceptualizations of cultural landscapes reflect the full range of human activities, all of which are perceived of as being a part of life and thus culturally significant. Native American landscapes, however, are much larger in geographic space than are those considered by the NPS guidelines. The latter suggests that tracts of several thousand acres are the upper size limit for cultural landscapes (NPS 1994:94). By simply broadening the spatial parameters of cultural landscapes, the NPS and Native American conceptualizations of these cultural resource units can be united.

Levels of Cultural Landscapes

We now outline the major types of cultural landscapes as they are perceived by many American Indian people. In terms of both size and function, there are six types of Native American cultural landscapes: (1) eventscapes, (2) holy landscapes, (3) storyscapes, (4) regional landscapes, (5) ecoscapes, and (6) landmarks.

Eventscapes

Eventscapes occur when people within and between ethnic groups jointly participate in an activity. By participating in this activity they tie together in special ways themselves and the places where these events occur. One such event that occurred in the region surrounding Hoover Dam was the Ghost Dance. Both Paiute and Hualapai people jointly danced in 1890 in order to restore the world as it was traditionally. This eventscape has been fully documented in a recent article (Stoffle, Loendorf, Halmo, Austin, Bulletts 2000) and is available on a web page at http://www.journals.uchicago.edu/CA/.

Holy Lands

Edward Spicer (1957) used the term *holy lands* to explain one of the broadest and most fundamental connections between American Indian people and the land. "Holy land" is a term that seeks a common land perception in order to convey to non-Indian people the cultural significance of Native American land perceptions. A holy land is created by a supernatural being who establishes a birthright relationship between a people (however defined) and that portion of the earth where they were created. This relationship provides the people with special rights to use and obligations to protect resources on that portion of the earth. The relationship between a people and their holy land cannot be broken, even by a diaspora. Forced relocation by another ethnic group will not break a relationship created by the supernatural, so holy land ties tend to be viewed similarly by contemporary occupants and those who have moved away.

Although the term "holy land" conveys many similar features between land conceptions held by American Indians and those of people from other societies, there are also distinctions. Holy lands tend to be where a people were created by the supernatural, but the location of this place in real and spiritual space may differ. Middle Eastern religions, for example, view the surface of the earth as the only existing surface, while many Native Americans perceive of living surfaces above and below this one. The holy land on this earth surface may have been produced when the people emerged from another earth surface below this one where they were originally created. The center of the Zuni Indian Pueblo is such a place.

The term "holy land" never exactly fits American Indian views of ethnic origin lands, but many Indian people have accepted this as a gloss for their perception of creation lands and have agreed to assign a term to it. These terms tend not to exist in the Indian language, probably because the concept is foreign. The Navajo Nation, for example, officially uses the English language term *Navajoland* when referring to an area bounded by the four sacred mountains (Kelley and Francis 1993). The Pima-speaking people of southern Arizona and northern Sonora Mexico refer to their creation land by the Spanish language term *Pimería Alta* (Griffith 1992:xix). The use of foreign terms to refer to Indian places is common; after all, the term *Navajo* is a Spanish label for a people who call themselves *Dine*, and the term *Pima* is a Hispanicized mislabel for people who call themselves *O'odham*.

Storyscapes

The term *storyscape* refers to a portion of a holy land that is delineated by Native American stories or songs. Storyscapes may even exist outside of holy lands, a point that raises questions about whether storyscapes can serve to integrate humankind as well as the Indian people who hold them.

The structure and meaning of the story landscape or storyscape derives only from where the story or song occurs. The storyscape is held together neither by common topography nor common plant and animal ecology. Quite the contrary, the story or song proceeds from place to place based on the activity it is conveying. Often the story is about spiritual beings that can move without reference to topography; that is, they can fly, swim along underground rivers, pass through mountains, or even move telekinetically.

A great variety of storyscapes crisscross the landscape of American Indian holy lands. Many of these involve a time before today's humans existed, what some would call a *mythic time*. It is important to note that the term "mythic" implies only another time before present time; however it does not imply that either that time or the stories were fictitious. A story about the movements of mythic beings conveys the sense of purpose in the behavior of the mythic beings, but the story itself also is tied to places where either events occurred or the mythic being specifically established some relationship with the landscape (Kelley and Francis 1994). Vecsey (1988:145) concludes that in Navajo myth, physical place is as important as what is happening in the story because the geographic references tend to emphasize the movement and vivacity of the hero. The mythic text cares little for the products of heroism; instead it sings the praises the heroic journey, setting an example for the patient to be healed by the Chantway and thereby become restored in health through his own motion.

In general, Indian myths, like those of the Navajo, occur along a storyscape that topographically represents what the story conveys. A hole in a sandstone cliff may be where a mythic being shot an arrow at an opponent, and a stain of color in a rock may represent an eagle frozen in flight.

Were one to pass along the path of the story, the landscape would be marked with story or song points. Moving from point to point permits a living person to physically reenact and directly experience the story or song. A Lillooet person told Romanoff (1992:227) that the Lillooet Coyote story is marked by places where it occurred and that such landmarks are memorably named and arranged by the myth, so that a child hearing the myth acquired an internal map that he could follow on the ground. Generally, specifically noted story or song landscape points are not more important than the less specific physical space between them, because they all constitute the geographical path of the storyscape.

Regional Landscapes

Regional landscapes are components of Native American holy lands. Like other cultural landscapes, they are defined in terms of both geography and culture. Typically, regional landscapes are spatially expansive, involving hundreds, perhaps thousands, of square miles. A major geographical feature often defines a regional landscape. Examples include the Black Hills of South Dakota or the Grand Canyon of Arizona. A major river like the Columbia may define a

regional landscape, as can a desert like the Mohave. A regional landscape is the first level of cultural abstraction that can be expected to correspond with an *ecoregion* (such as the Mohave Desert) that is defined as somewhat unique by its biotic and abiotic characteristics (Golley 1993).

Usually, with a regional cultural landscape there are somewhat unique natural resources that are generally bounded by a major geographical feature. For example, there are certain types of plants and animals found in the Black Hills, the Grand Canyon, and the Sonoran Desert. When American Indian people used the natural resources of a regional landscape over long periods, then specific adaptive strategies developed and were incorporated into their overall cultural system.

Human adaptive strategies reflect, but are not determined by, their environment. Environmental deterministic theories have long since been set aside because studies demonstrate that ultimately people can live anywhere and do so largely on their own terms (Moran 1990, Vayda 1969). There are many dynamics between people and their environment (Ness, Drake, Brechin 1993), and these special relationships tend to be criteria in defining cultural landscapes, including regional landscapes.

Ecoscapes

Some new terms are necessary to clarify past discussions with greater conceptual specificity. One of these, *storyscapes,* and it has already been discussed. Another new term, *ecological landscapes or ecoscapes,* points to the special relationship between American Indian cultural landscapes and the well-defined natural ecosystems they encompass.

The term *ecoscape* refers to a portion of a regional landscape that is clearly defined by an unusual or distinct local geography and its unique cultural relationship to an American Indian group or groups. The ecoscape tends to be recognizable terrain that has already been named by both Indian and non-Indian people. It may be a mountain range, a long canyon, or an area with many hot springs. The ecoscape is, by definition, smaller than the regional landscape in which it is found, but the two are directly related. The geographical structure and cultural meaning of a regional landscape derives in large part from the structures and meanings of the many ecoscapes it contains. For example, the Mohave Desert is composed of great expanses of dry lake beds and their surrounding mountains, a massive unique valley called Death Valley, and dramatic areas defined by volcanic cinder cones, magma tube tunnels, and mesas capped by surface lava flows. Each has the potential of becoming an ecoscape due to its own physiological components, the unique plant and animal communities it supports, and the special relationships it has with Indian people. Together, these ecoscapes become the Mohave Desert as a regional landscape.

Indian people ultimately define an ecoscape when they specially incorporate this local geography into their culture. The ecoscape may be viewed as a power place or a series of connected power places. It may have the shape of a creation being that is lying down, like *Kuuchamaa*, the Kumeyaay sacred mountain (Shipek 1985). It may provide mineral waters for healing. It may be of special historic importance. Each ecoscape will serve a special role in the history and culture of an Indian group and it will contain numerous places of specific cultural significance.

Landmarks

The term *landmark* refers to a discrete physical place within a cultural landscape (Kelley and Francis 1993:158). A landmark tends to be a small part of the local geography that is topographically and culturally unique. Landmarks are easily defined both in terms of their physical boundaries and the reasons why they are culturally important. A landmark may be a salt cave, which is the source of an essential natural element, the object of numerous pilgrimages, and the end of a storyscape. A landmark may be a deep spring in the desert that is surrounded by pictographs from past ceremonies, plants for food and medicine, and water for the irrigation of gardens. A landmark may be a power rock that will heal sick people if they can talk to it in an Indian language and perform the proper ceremony.

Landmarks tend to be obvious places that seem to demand the focus of intense cultural interest. The residual volcanic core standing on the high plains of Wyoming, for example, called by Lakota people *Mato Tepee* (Bear's Lodge) and by other people Devil's Tower, became the focus of cultural interest of at least ten American Indian groups as well as the federal government which made it a national monument (Evans, Dobyns, Stoffle, Austin, and Krause 1994:73-79). The central natural springs that gave Las Vegas (the Meadows in Spanish) its name are such a landscape (Stoffle et. al 1998).

Because of what might be termed inherently interesting features, it is relatively simple to convey the cultural importance of such landmarks to people belonging to another culture. As easily identifiable places whose meaning is readily conveyed to others, landmarks are ideal subjects for cultural protection and management. Except for Mt. Shasta, most TCPs are defined as landmarks; however, the upper portion of Mt. Shasta has recently received the TCP designation making it the largest TCP. In fact, most cultural resource protection laws in the U.S. are designed to protect landmarks. However, a few laws are designed to protect larger geographic units like ecoscapes.

American Indian Cultural Ecoscapes in Riverine Ecosystems: A Model and a Theory

The idea of developing a model and theory of riverine ecosystems was initially conceived and presented at the 1997 Society for Applied Anthropology (SfAA) meeting in Seattle, Washington. Then, as now, the driving observation was that from an American Indian cultural perspective there ***is something special about rivers and the valleys that contain them***. That initial session on this topic laid out ideas regarding the importance of water, watersheds, rivers, and cultural resources near rivers. Participating in that session were representatives from three American Indian ethnic groups who shared ideas on this topic: the Skokomish, who live on the Skokomish River as it runs into the southern end of Puget Sound; the Wanapum, who live on the middle Columbia River at the junction of the Snake and Umatilla Rivers; and the Southern Paiutes who live along more than 500 miles of the Colorado River. Each of these ethnic groups sent elders to that SfAA session to explain their cultural attachments to these rivers and the surrounding valleys. This model and theory builds on those cultural perspectives as well as on the interactions our team have had with Mohave and Hualapai elders since then. This portion of

the chapter is viewed as yet another step towards what may be a model and eventually become a theory for understanding why rivers and their valleys are so important to Indian people.

The General Model

Since 1997 our University of Arizona research team has published four articles11 and a number of reports that address the issue of what are American Indian cultural landscapes. These studies present what we believe to be the first stages in developing a general model of landscapes and an initial theory (based on the concept of Puha or power) regarding how the model works. **The first point** is that there are regular elements of the riverine model – which are both natural and human conceived. These elements, singularly or in combination, produce a **cultural cognition** of places and the spaces between them. The **second point** is that these places are related to other places forming a higher level of complexity and abstraction, which we call **place networks**. **The third point** is that place networks are in turn **related to one another** at increasingly higher levels of complexity and abstraction until reaching the spatial and temporal limits of ethnic group's cultural cognitions. It is important to pause and realize that these cognitive limits may exceed, and are certain to be different than, those perceived by non-Indians and may reach spatially outward to interplanetary and interstellar relationships as well to spatially otherworldly plains of existence. All of these spatial relations will have real time and other time (mythic time) dimensions. Is it any wonder that we anthropologists have taken so long to piece together the story of American Indian cultural landscapes.

Briefly and simply, cultural landscapes are geographically referenced units of human culture that are both spatially nested within one another and vertically layered through time. At the largest currently modeled spatial level[12], American Indian landscapes in the GSE/NM region involve **(1) Eventscapes** – interethnic connections produced by joint participation in culturally critically and persistent events such as the Ghost Dance of 1890, **(2) Holy Lands** – are that geographic area where a people were created thus given their birthright attachments and responsibilities to their land; **(3) Song- and Story-Scapes** which identify rather narrow but often very long strings of places connected by a combination of spiritual or physical trails; **(4) Regional Landscapes** which generally define broad area of activities and spirituality that reflect broad ecological areas like the Mohave Desert and sociocultural interactions reflected in social subdivisions like a district, **(5) Ecoscapes** (the focus of this chapter and the GSE/NM EIS) which are unique and interactive biotic and abiotic systems that are somewhat bounded by a topographically unique area such as a canyon, mountain range, or watershed, and **(6) Finally, the smallest unit is a Landmark** – a highly unusual topographic feature that tends to attract the attention of people – such as a hot spring, big cave, jagged mountain peak, or volcanic neck sticking up out of the Colorado River.

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11 Stoffle, Austin, and Halmo 1997; Zedeno, Austin, and Stoffle; Dewey-Hefley, Zedeno, Stoffle, Pittaluga; and Stoffle, Loendorf, Austin, Halmo, and Bulletts 2000.

12 At this time we have not modeled landscape connections to other temporal and spatial dimensions but these are real elements of the whole cognitive system and may be critical for understanding access to and use of puha – power.

Riverine Ecoscapes

When we focus on riverine cultural landscape, we begin by talking about ecoscapes. Riverine ecoscapes are cultural constructs (by this we mean they clearly are only known through the minds of humans), but they have both natural and human elements. Some would say that both the natural and human elements are in fact human artifacts. From this perspective there are no inherent meanings in nature, thus when common constructs are made about similar natural elements it is strictly because the people will it so, rather than because there is some characteristic of the natural elements that caused the common response. A recent book called **How the Canyon Became Grand** by Stephen Pyne maintains that the Grand Canyon was made into a nationally valued area by the work of a handfull of powerful white men. This is what may be called the "there is nothing out" theory. In contrast, there is a book called **Reinventing Nature: Responses to Postmodern Deconstruction** by Michael Soulé and Gary Lease that take this position to task. They maintain that nature does exist and influences human cognition whether we know it our not. From a Native American standpoint, nature is alive, willful, and talks. Nature is interactive and responsive to the behavior of humans, healing sometimes and punishing at other time. The essential balance defined at Creation can only be achieved by a two-way flow of communication and culturally appropriate behavior between people (especially those people chosen by the Creator to be in this holy land) and nature.

Natural Elements

What are the key natural elements that define a riverine ecoscape and the landmarks within it as culturally important? [See Figure 1: Natural Elements of a Riverine Ecoscape]. Riverine ecoscapes that become central in the lives of Indian people have the following elements (1) a river, (2) volcanic flows, (3) hot springs, (4) caves, (5) medicinal plants and animals, (6) paint source, and (7) geographic features like a mountain peak or big rock. There are interesting relationships between these elements.

It is important to begin this discussion of these natural elements with the river – a power force that carves canyons and brings life to the region. Then there are volcanic lava flows – these arise at the edges of the river often flowing directly into it, only to be carved out again by the primary force of water erosion. Hot springs form as an offspring of volcanic activity and water and tend to be near both – sometimes actually at the edge of the river. Caves – are a product of erosion but more importantly are imbedded entrances into a mountain.

Medicine plants are always useful but gain strength when they live at the edge of a river or near volcanic flows. Medicine animals also derive and share the special powers of a specific area. Many types of paint (especially red ochre and yellow ochre) are found near lava flows because they can be produced at the contact point between previous earth and a volcanic lava flow. And finally there are geographic landmarks those highly nuanced protuberances – or places that speak a story of power to all people and provide a universal and dramatic setting for human activity.

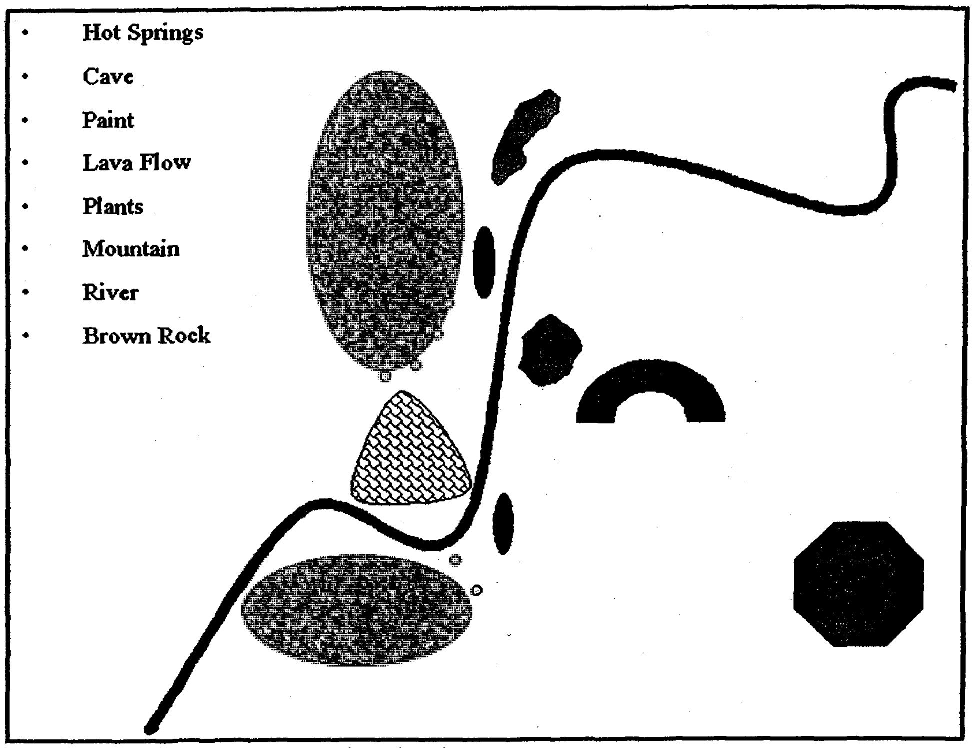

Figure 1 Natural Elements of a Riverine Ecoscape.

Human Elements

Humans respond to these natural elements and regularly attach certain types of meanings to them producing the cultural conceptualization of the riverine ecoscape [Figure Human Elements of a Riverine Ecoscape]. Riverine ecoscapes commonly have the following human elements: (1) an origin story, (2) an identification of component places as having special purposes, (3) a connection between places derived from sequential ceremony, (4) rock peckings and paintings, and (5) historic event layers.

It seems that places of great cultural significance have an **origin story** that explains why they are there and what is their purpose. Such stories may occur at the beginning of creation when the place and the people were formed together, or they may happen later during what some call "mythic time" when things are not just as they are today. In mythic time animals can talk to strange beings and great deeds can be accomplished by rabbits.

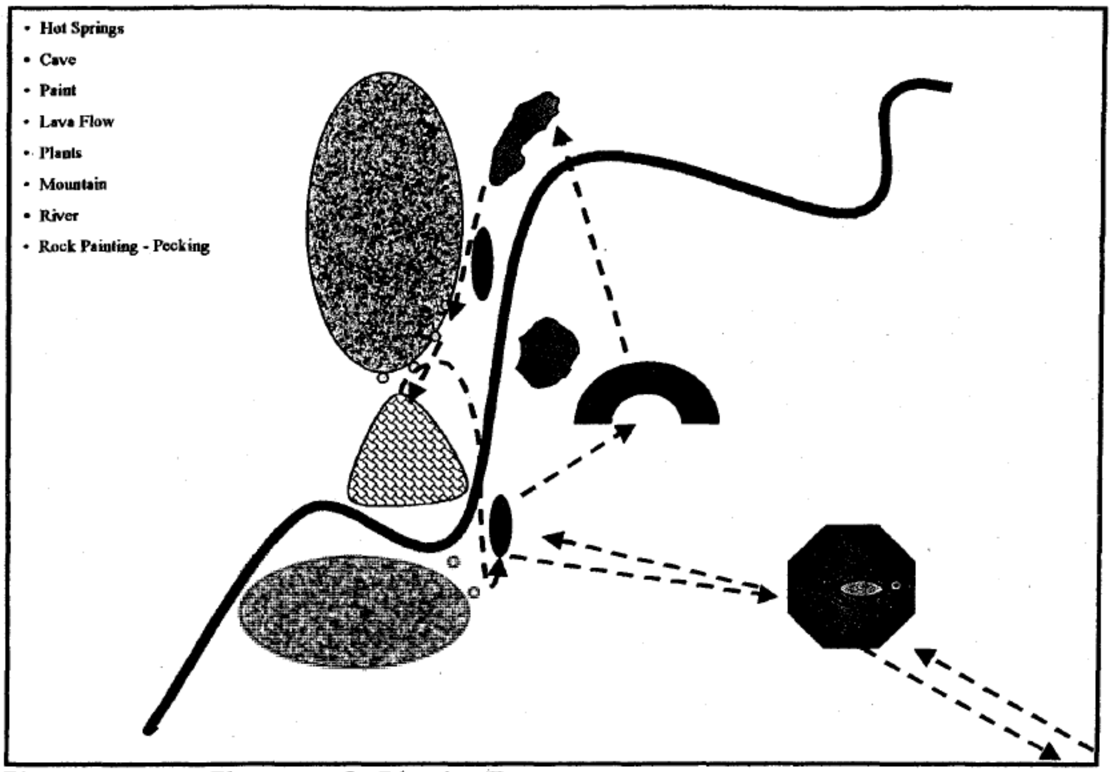

Figure 2 Human Elements of a Riverine Ecoscape.

Within the riverine ecoscape are **places that have special purposes.** Examples include caves where one can receive medicines or songs, places of curing such as a rounded mountaintop, and places that are portals for travel to other worlds. These special purpose places tend to be associated with the different natural elements discussed above, but can exist where there are no unusual natural resources. When two kinds of natural elements come together, like a river and a volcanic lava flow or the narrowing of space along a well traveled trail by canyon walls, a special place is formed that may elicit the formation of rock peckings and paintings. These marks on rocks are either made by powerful humans or by tiny anthropomorphic beings. The peckings are symbols indicating that the place is powerful. As such, the place, rather than the symbols is the center. The pecked or painted places marked often indicate where power moves into and out of the earth, and may be a place where a vision can be received or where a qualified person can prepare to go into a more powerful area like a cave or curing landmark.

Places within a riverine ecoscape that are identified in the culture are often **connected though sequential ceremonial activity**. This network of place connections is the foundation of the riverine cultural landscapes. It should be noted that a single network of connected places (itself a cultural unit) is connected with other similar cultural units. The entire spider web of relationships between places and networks of places is the foundation and ultimately the definition of all cultural landscapes. This spider web of place and network relationships extends outward spatially and back in time temporally thus becoming the world where an ethnic groups lives. As such, this spider web of places and networks is the foundation for understanding, predicting, and managing how life will be for this ethnic group in the future. Breaks in the spider

web threaten the cultural cohesion of the people; and, given their perceptions of the web, the existence of the earth.

Once the human dimensions of riverine ecoscapes are created they and the places so conceived operate as places of power used by people again and again. Though time, new meanings are attached. Historic events can add a layer – such as when an isolated canyon that once served as a spiritual retreat for medicine people becomes a region of refuge for all people hiding from an aggressor. Both meanings (place for medicine people and place to hide) still exist but do so as separate landscape layers. Through time, such historic events create what we eventscapes and together with previous landscape meaning can create at one place "cultural landscape layering."

A new landscape layer, such as an eventscape, can be created when a people face a great crisis and they use their place of balance and power to solve the problem. If the crisis is massive, the balancing ceremony itself becomes a cultural landscape layer that is attached to this riverine ecoscape. For example, amongst the Southern Paiute, the Ghost Dance of 1889-1890 was practiced in places that had been relied on for seeking balance. We maintained that the Southern Paiutes were not only dancing in Kanab Creek – an riverine ecoscape that itself was then being used as a region of refuge, but they were Ghost Dancing the Grand Canyon itself - asking this special region to use its power to help solve the problems confronted by the Ghost Dance.

Disastrous social and environmental changes were occurring to thousands of Indian people in North America and together they chose this healing event to solve these massive problems. The Indian peoples who danced the ceremony of renewal potentially (it has yet to be documented every where) created a network of relationships between themselves, the other dancers, and the placed danced. A new cultural landscape layer potentially was added to each place it was practiced. For the Kaibab Paiute people this involved Kanab Creek, the Grand Canyon regional landscape, their holy land, the lands of the Hualapai with whom they directly dance, and to hundreds of other distant places beyond Paiute lands where the dance was performed according to the prophet Wovoka's vision. By performing the Ghost Dance ceremony all of these people and places were tied together into what we call an eventscape.

Puha As Theory

It is beyond the scope of this chapter to explain why Puha is the most likely epistemological candidate to explain the cultural significance of places and cultural landscapes in riverine ecoscapes. However, a few ideas are presented here to begin this argument that is the subject of another longer essay. This short section is specifically focussed on the culture of Numic and Yuman speakers and should only be extended as an explanation in other Indian cultures with the addition of epistemological support evidence from those cultures.

The presence of power is viewed by American Indian people in the western United States as the most robust explanation for why things are culturally significant, how these things are related to one another, and ultimately how they are intellectually integrated. According to Liljeblad (1986:643-644) supernatural power ... was everywhere a source of individual competence, mental and physical ability, health, and success; for this concept the Numic

languages use cognate forms of a single term: Mono and Northern Paiute *puha,* Shoshone *puha* and *poha,* Kawaiisu *puhwa,* Southern Paiute *pua-,* Ute *puwavi.* According to Lamphere (1983: 744), many general characteristics of North American shamanic religion were apparent in the practices of the Yuman peoples of the Colorado River...For example, the shaman who has the power to cure acquires it through a dream experience. The connection between dreaming and power can be seen in the Maricopa work *Kwstma's* "one who has power," literally "the one who dreams." The Maricopa words for dream and spirit are the same: *sma'k* (Spier 193: 237-238, cited in Lamphere 1983). The dream is usually one in which the shaman travels to a sacred mountain place; where he encounters either a spirit of the mountain, a bird, or an animal who teaches him songs, gives him the opportunity to cure a sick person, or in some other way gives him the power to cure...Among the Walapai (Kroeber 1935: 188, cited in Lamphere 1983) a man may actually go to a mountain, build a fire in a cave, and spend four nights, during which time he dreams and acquires power from a spirit.

Power is a highly abstract concept that has largely been overlooked by scholars who have studied the culture of American Indian people in the west. This has occurred because it is both esoteric (thus not fully understood by all members of the society) and confidential (thus not to be explained to outsiders or Indian persons who may not used the knowledge of power in a culturally appropriate way). Miller (1983: 68) estimates that only about 20% of an Indian ethnic group possesses information about power, and less than 5% has a systematic overview (see Stoffle, Halmo, and Evans 1999 regarding the distribution of Numic plant knowledge). Similarly, Tilley (1994:26) maintains that places are not equally shared and experienced by all people and in human society the ability to control access to and manipulate particular settings for action (that is power places) is a fundamental feature of the operation of power as domination. In other words, knowledge about power (and visits to power places) is shared on a need to know basis and only with those who should have cultural access whether the person asking about it is an Indian person or a federal land manager.

The best way to understand how the world is connected in Numic and Yuman culture is to begin with the concept of a "living universe". This is an epistemological foundation of Numic and Yuman culture, or what Rappapport (1999:263-271; 446) calls Ultimate Sacred Postulates. These terms simply mean that the concept of a living universe is so basic in Numic and Yuman culture that you cannot understand many other aspects of culture without first fully recognizing this concept.

A living universe is alive in the same way that humans are alive. It has most of the same characteristics as humans. The universe has physically discrete components that we will call *elements* and something like energy that we will call *power.* These are a few general statements that we can make about power:

- Power exists thoughout the universe, but like differences in human strength, power will vary in intensity from element to element.
- Power varies in what it can be used for and so determines what different elements can do.
- Power is networked, so that different elements are connected, disconnected, and reconnected in different ways, and this occurs largely at the will of the elements that have the power.

- Power originally derived from Creation and permeates the universe like spider webs in a thin scattering and in definite concentrations with currents, generally where life is also clustered.
- Power exists and can move between the three levels of the universe upper (where powerful anthropomorphic beings live), middle (where people now live), and lower (where super-ordinary beings with reptilian or distorted humanoid appearance live).

Summary

This portion of the chapter has focussed on presenting a descriptive model and a theory of riverine ecoscapes. The writings of Tuan, Greider, Feld, Basso, Strang, Tilley and others are leading us towards an understanding of just how essential cultural landscapes are to humans. This line of investigation needs to proceed, because it can help explain why Indian people (and others with long standing traditional ties to the land) express such grief when riverine cultural landscapes are impacted by projects and it can provide arguments for protecting cultural landscapes. In riverine ecoscapes, water makes a central contribution to ecoscape including being a source of life, creating spectacular geology, becoming a source of demonstrated power, and carving water-canyons which serve as regions of refuge for Indian people. Special places occur along rivers when a combination of natural elements also occurs, thus producing the necessary foundation for complex ceremonial activity.

Chapter 6

CONCERNS AND RECOMMENDATIONS FOR ETHNOGRAPHIC RESEARCH, RESOURCE PRESERVATION, AND MANAGEMENT

General Concerns

This report represents the first stage of ethnographic assessment of Kaibab Paiute Cultural Resources in the Grand Staircase-Escalante/National Monument. Through consultations with representatives of the Kaibab Paiutes, site visitations, and multidisciplinary research strategies, we have determined that the Kaibab Southern Paiutes have enduring ancestral, historical, and contemporary cultural attachments to those portions of the Grand Staircase-Escalante/National Monument that overlap with the Eastern Yanawant Territories of the Southern Paiutes.

The Kaibab Southern Paiute continue to experience strong attachments to the sites of Skutumpah (Rabbitbrush Water), the Upper Ankati (No Mans Mesa Area), Ipa (Navajo Well), and Tupac (Black Water), which are amongst the sites identified by Isabell Kelly's (1971) consultants in ethnographic research conducted during the 1930s. The strength of current attachments reflects the significance these places held for the ancestors of the Southern Paiutes as well as enduring relationships to the land.

In part, these sentiments are expressed through a sense of responsibility to ensure that people maintain ecologically sound relationships to the plants, animals, land, and both archaeological and cultural resources within this region. In addition, Kaibab elders have expressed a desire to reestablish physical relations with places that have continued to remain culturally significant amongst tribal members through the present day.

In order to facilitate the development of policies that reflect these concerns, we recommend the following:

Renewed Site Visits

At present, some Kaibab elders have visited four of the major sites identified by Kelly's (1971) consultants. In a second round of studies it would be beneficial for other Kaibab Southern Paiute elders to visit Skutumpah (Rabbitbrush Water), the Upper Ankati (No Mans Mesa Area), Ipa (Navajo Well), and Tupac (Black Water). Through these visitations and further collaboration, we can more clearly articulate the nature of previous Southern Paiute occupations as well as the interconnections between these sites and present day descendents.

Expanded Site Visitations

Due to the extensive prehistorical and historical occupation of sites near multiple springs within the GSE/NM, further visitations are necessary in order to identify the medicinal plants, artifacts, and potential burials within these regions. As onne Southern Paiute elder noted, "Where there's water, there are artifacts."

In the original round of field studies we were able to visit only a small portion of the sites identified by Kelly's (1971) consultants as places traditionally occupied by Southern Paiutes within the GSE/NM. Initial site visits indicated the presence of traditional medicinal plants, natural vegetation used for basket making and other types of traditional material culture, lithic scatters, and certain plants and animals traditionally used for subsistence.

Co-management

The Kaibab consultants indicated that they are invested in ensuring the physical and cultural welfare of the portions of the GSE/NM where aboriginal (and presumably earlier) Southern Paiute sites have been mapped and identified. In the role of co-managers, the Kaibab consultants could facilitate the protection of medicinal plants, artifact, and potential burial sites. In addition, they could serve the significant functions of representing tribal concerns, collaborating with park representatives, and providing in-depth understandings on the dynamic interplay of culture preservation and contemporary land use practices.

Tribal Access

Access to traditional sites is neces. ıry to permit the transmission of sacred and cultural knowledge from elders to youths. At pres ıt, access to many of the sites traditionally occupied within the GSE/NM has been restricted due to increased non-Indian settlement, cattle and sheep grazing, the establishment of farms and corporate cattle ranches, and road building. In order to permit practices conducive to cultural preservation, policies need to be established that enable Southern Paiutes to physically as well as ideologically interact with the landscapes of their predecessors. In addition, studies that identify and describe the perceived needs of diverse groups to portions of the GSE/NM as well as the ways in which they conceptualize their relationships to the land would greatly facilitate the process of developing policies that reflect multiple attachments to this land.

Expanding Government to Government Consultations

The previous recommendations indicate a growing need to expand government to government consultations. Kaibab elders have expressed an interest in further developing collaborative working relations with representatives of the National Park Service and related agencies.

Through the present study, we have begun to identify Kaibab Southern Paiute relations to sites within the GSE/NM. In future ethnographic studies of the GSE/NM, both San Juan Southern Paiutes and the Paiute Indian Tribe of Utah should be asked to participate in site visitations as well as government-to-government related consultations.

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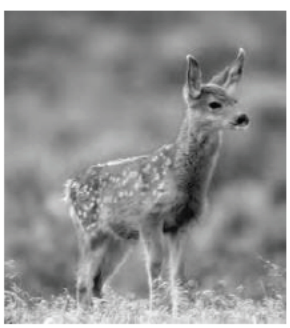
Grand Staircase-Escalante National Monument

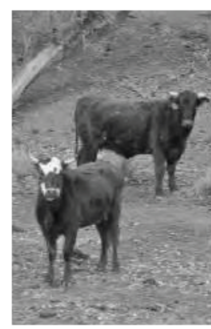
Bureau of Land Management
US Department of Interior

BLM

Livestock Grazing Plan Amendment Environmental Impact Statement

ANALYSIS OF THE MANAGEMENT SITUATION





July 2015

NATIONAL CONSERVATION LANDS

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ACRONYMS AND ABBREVIATIONS

Acronym	Full Phrase
AIM	assessment, inventory, and monitoring
AMS	analysis of the management situation
AUM	animal unit month
BLM	United States Department of the Interior, Bureau of Land Management
CFR	Code of Federal Regulations
EIS	environmental impact statement
EPA	United States Environmental Protection Agency
FLPMA	Federal Land Policy and Management Act of 1976
Glen Canyon	Glen Canyon National Recreation Area
Glen Canyon GMP	Glen Canyon General Management Plan (1979)
Glen Canyon GzMP	Glen Canyon National Recreation Area Grazing Management Plan (1999)
GSENM	Grand Staircase-Escalante National Monument
IM	instruction memorandum
MFP	management framework plan
MMP	Monument Management Plan (2000)
MMP-A	Monument Management Plan Amendment
NPS	United States Department of the Interior, National Park Service
NRCS	United States Department of Agriculture, Natural Resources Conservation Service
NVCS	National Vegetation Classification System
PFC	proper functioning condition
REA	rapid ecoregional assessment
SRMA	special recreation management area
US	United States
USC	United States Code

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Chapter 1 Introduction

The United States Department of the Interior, Bureau of Land Management (BLM), Grand Staircase-Escalante National Monument (GSENM) is preparing a Livestock Grazing Monument Management Plan Amendment (MMP-A) and associated environmental impact statement (EIS) to guide management of BLM-managed lands within GSENM, as well as lands for which GSENM has administrative responsibility for livestock grazing. The BLM manages livestock grazing on the affected lands according to land use decisions set by four regional management framework plans (MFPs) signed in 1981: Escalante (BLM 1981a), Paria (BLM 1981b), Vermilion (BLM 1981c), and Zion (BLM 1981d), a subsequent plan amendment completed in 1999 (BLM 1999), and the US Department of the Interior, National Park Service (NPS), Glen Canyon National Recreation Area (Glen Canyon) Grazing Management Plan (GzMP; NPS 1999).

The GSENM MMP (BLM 2000) did supersede many of the decisions in the four MFPs, but it did not replace the grazing decisions in them. The MMP states, "There are several areas for which major decisions have been deferred. For example, because Monument designation does not affect existing permits or leases for, or levels of, livestock grazing, grazing will ultimately be addressed after the completion of assessment for each grazing allotment and the preparation of new allotment management plans" (BLM 2000, p. 4). Therefore, the four MFPs and the 1999 amendment are the guiding planning level documents for livestock grazing in GSENM.

1.1 Purpose of the Analysis of the Management Situation

The BLM has prepared the analysis of the management situation (AMS) to analyze available resource inventory data and other information to characterize the resources undergoing analysis, portray the existing management situation, and identify management opportunities to respond to identified issues. The AMS provides the basis for formulating a reasonable range of alternatives (43 Code of Federal Regulations [CFR] 1610.4-4).

The AMS describes current conditions and trends of the relevant resources and uses/activities in the planning area. The AMS also provides information on existing management practices, including direction from existing plans and agency policy, local resources, and resource uses. The AMS provides sufficient detail to create a platform for resolving planning issues through the

development of alternatives. The information in this AMS reflects the information and data available at the time of its completion. The BLM will refine analyses as needed based on additional compilation and analysis of data throughout the MMP-A/EIS planning process.

This AMS addresses the issues relevant to livestock grazing management; it is not intended to be an exhaustive review of everything known about the resources and uses/activities in the planning area.

This document addresses the current management situation and is the foundation for the alternatives development process. Alternatives presented in the Draft MMP-A/EIS will draw on the management opportunities identified in this document. Each alternative will include desired outcomes (goals and objectives), and the allowable uses and management actions anticipated to achieve those outcomes.

1.2 DESCRIPTION OF THE PLANNING AREA

The planning area encompasses approximately 2,316,100 acres in Garfield and Kane Counties, Utah, and Coconino County, Arizona. The planning area includes all BLM-managed lands within GSENM and BLM- and NPS-managed lands for which GSENM has livestock grazing administration responsibility. This includes lands within portions of the BLM's Kanab and Arizona Strip Field Offices, as well as NPS-managed lands in Glen Canyon. The planning area is bordered on the west by Bryce Canyon National Park and the BLM Kanab Field Office, on the north by Dixie National Forest, on the east by Capitol Reef National Park and Glen Canyon, and on the south by the BLM Arizona Strip and Kanab Field Offices, Utah State and Institutional Trust Lands, and Glen Canyon. Small areas of state, municipal, and private lands are contained within the planning area (see Figure 1-1, Planning Area).

The BLM's decision area for this planning effort includes all BLM-managed lands for which GSENM has livestock grazing administration responsibility, including some lands within the BLM Kanab and Arizona Strip Field Offices. The NPS decision area includes lands within Glen Canyon for which GSENM has livestock grazing administration responsibility. The decision area totals approximately 2,253,700 acres within the planning area and does not include state, municipal, or private lands. Table 1-1, Landownership, shows acres by landowner within the planning area and the decision area.

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Figure 1-1

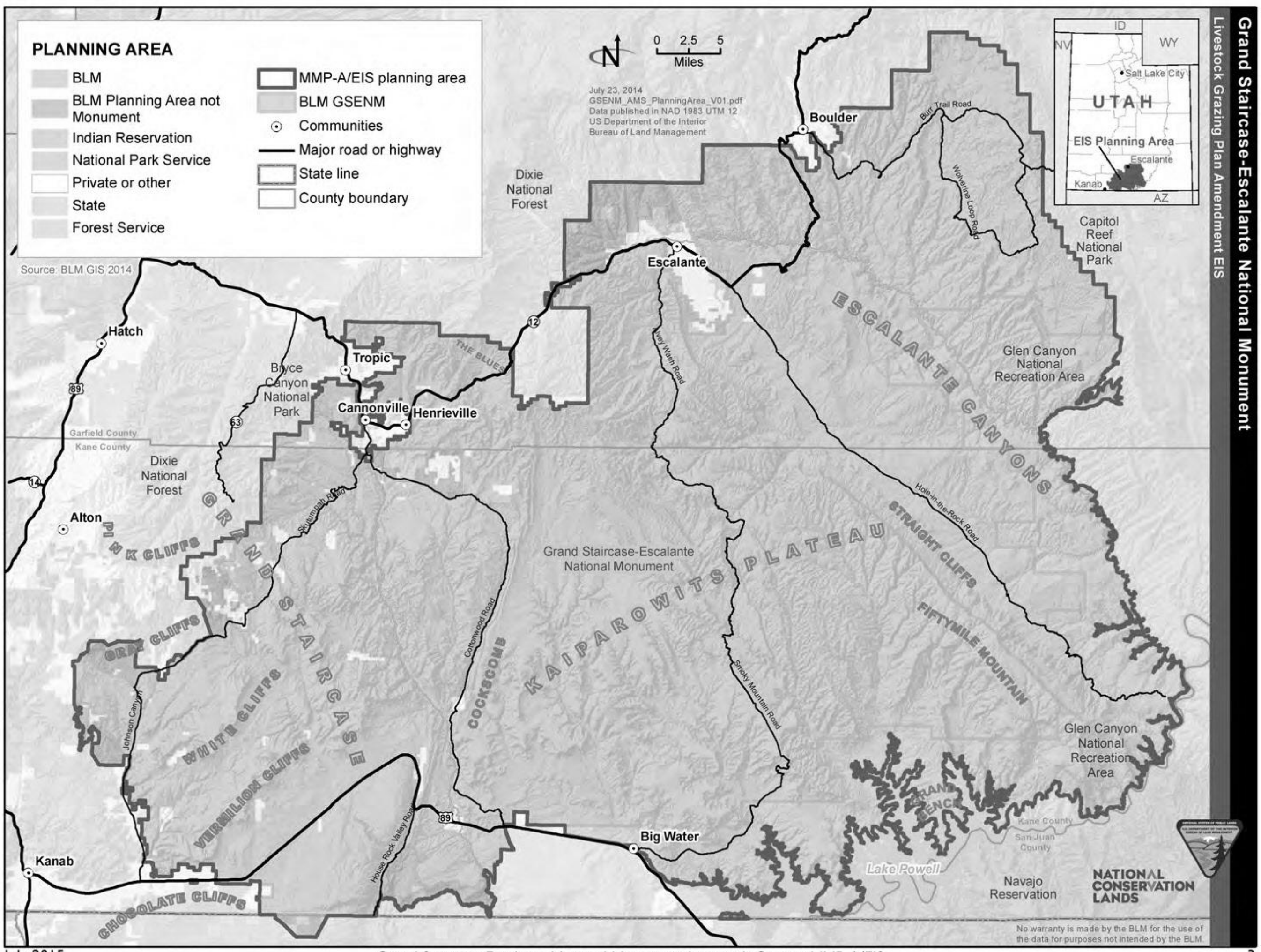

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Table 1-1
Landownership

Landowner	Acres
Planning Area	
BLM	1,934,800
NPS	318,900
State	19,900
Private	42,500
Total	***2,316,100***
Decision Area	
BLM, GSENM	1,866,500
BLM, Kanab Field Office	54,800
BLM, Arizona Strip Field Office	13,500
NPS, Glen Canyon	318,900
Total	***2,253,700***

Source: BLM GIS 2014a
Note: Acres have been rounded to the nearest 100.

1.3 Livestock Grazing Administration in Glen Canyon National Recreation Area

In 1972, Congress passed Glen Canyon's enabling legislation (Public Law 92-593). The legislation created the recreation area as a unit of the National Park System, managed by the NPS in accordance with the 1916 Organic Act. The purpose of the recreation area, as described in the enabling legislation, is "to provide public outdoor recreation use and enjoyment of Lake Powell and lands adjacent thereto…and to preserve and protect the scenic, scientific, and historic features contributing to public enjoyment of the area." The values of Glen Canyon are the "scenic, scientific, and historic features" indicated in the recreation area's enabling legislation of 1972.

The 1979 General Management Plan (GMP) specifically identified the following values and purposes: vegetation, soils, wildlife, water quality, cultural resources (historic and prehistoric), scenic resources, recreation, and paleontology. Grazing, although not a purpose of the recreation area, is a use recognized by Congress in Glen Canyon's enabling legislation. The enabling legislation specifies that the BLM should administer grazing permits, which it does through four offices. One of these offices administers GSENM, which includes grazing on a portion of the recreation area.

GSENM applies BLM policies for issuing and administering grazing permits, such as the 1934 Taylor Grazing Act (43 US Code [USC], Section 315 et seq.) and the Federal Land Policy and Management Act of 1976 (FLPMA; 43 USC, Section 1701 et seq.). In addition, GSENM administration is subject to Glen Canyon's enabling legislation. Public Law 92-593 states that "the Secretary shall administer, protect, and develop the recreation area in accordance with the provisions of the (Organic) Act of August 25, 1916 (16 USC 1a et seq.), as amended and supplemented, and with other statutory authority available to him for conservation and management of natural resources to the extent he finds such authority will further the purpose of this Act." The Redwoods Act of March 27, 1978 states that in areas of the National Park

System, "The authorization of activities...shall not be exercised in derogation of the values and purposes for which these various areas have been established."

On September 4, 1984, to foster coordination between the two agencies, the directors of the BLM and the NPS signed an umbrella memorandum of understanding for grazing administration in units of the NPS where grazing is authorized. To implement this memorandum of understanding, an interagency agreement was executed in 1993 between Glen Canyon and both the BLM Utah and Arizona state offices. The intent of this agreement is to "conduct a program to coordinate grazing administration activities on [Glen Canyon] which shall be carried out by the respective BLM District Managers of the Arizona Strip, Cedar City, Richfield, and Moab Districts...and in coordination and cooperation with the Superintendent of [Glen Canyon]." This agreement states that the "BLM has expertise in developing, implementing, and analyzing grazing programs" and that "NPS has expertise in determining whether an activity is consistent with the values and purposes of [Glen Canyon]."

Until the Superintendent of Glen Canyon has completed a determination on the potential effects of the proposed action on the values and purposes of Glen Canyon, the BLM will not engage in any of the following:

1. Act on any grazing authorizations, range developments, management plans, management agreements, or resource monitoring and evaluation
2. Approve or act on a change in a grazing permit
3. Change the kind of livestock or the season of use
4. Implement new construction, reconstruction, or major maintenance of existing range developments or improvements
5. Institute a new or modified allotment management plan, grazing system, or resource monitoring or evaluation not covered by an agreed on plan

This process is called a values and purposes determination and it is to ensure that grazing activities do not conflict with the protection of resources, as called for in the 1916 NPS Organic Act or the Glen Canyon GMP (NPS 1979).

To give further clarity to the Glen Canyon values and purposes with respect to grazing practices across the recreation area, a grazing component of the GzMP was developed and signed in 1999 (NPS 1999). This plan was to be a foundational document to give management direction for the future of grazing practices across the recreation area. It was made to be flexible, allowing new data and methods to be incorporated into the determinations of park values and resource conditions and the management of livestock practices.

The 1999 GzMP identifies specific value statements for each fundamental recreation area resource. Resource management goals and 34 resource objectives were also developed with the assistance of local BLM offices. They would comply with the intent of the NPS Organic Act and Glen Canyon's enabling legislation and would help achieve each resource value. It is against these 34 objectives that approval of any proposed grazing activity across the recreation area, via a values and purposes determination, is based.

1.4 Resources and Resource Uses to be Addressed

This AMS focuses on resources and resource uses that provide context for the decisions to be made for livestock grazing in the MMP-A. Those resources and resource uses are livestock grazing, vegetation (including riparian vegetation and nonnative invasive plants), water, soil, and recreation. The EIS for the MMP-A will address a wider range of topics including: air quality, fish and wildlife, special status species, cultural resources, paleontological resources, visual resources, wild and scenic rivers, wilderness study areas, tribal interests, public safety, socioeconomics, and environmental justice. The BLM will also consider climate change trends and the additive effects of climate change coupled with management proposed under the various alternatives in the EIS. The BLM will prepare a separate socioeconomic baseline report that documents the socioeconomic condition in the planning area.

1.5 Key Findings

The BLM authorizes and manages livestock grazing in the planning area according to land use decisions set by the Escalante, Paria, Vermilion, and Zion regional MFPs signed in 1981 (BLM 1981a, 1981b, 1981c, and 1981d) and a subsequent plan amendment completed in 1999 (BLM 1999). Much has changed at the local, regional, and national levels since the BLM established these land use plan-level decisions for livestock grazing, and existing policies have been revised. These changes are as follows:

1. Establishment of GSENM in 1996
2. Establishment of the Utah BLM Standards for Rangeland Health and Guidelines for Livestock Grazing Management in 1997
3. Acquisition of approximately 175,000 acres of land within the GSENM boundary in 1998
4. Issuance of the Glen Canyon GzMP in 1999
5. Issuance of the MMP in 1999
6. Issuance of new policy and guidance for the National Landscape Conservation System in 2012
7. Increasing substantial and continuing visitation to GSENM and the surrounding BLM- and NPS-managed lands
8. Issuance of state and local plans, such as the Utah Grazing Agricultural Commodity Zones (updated 2015), Garfield County General Management Plan (2007), and Kane County General and Resource Management Plans (updated 2014 and 2015)

In addition, rangeland health evaluations and periodic monitoring has determined that current livestock grazing practices are factors in not achieving one or more rangeland health standards or do not conform to grazing management guidelines. Updated decisions for livestock grazing and rangeland management are needed to address the above changes and integrate with the existing MMP (BLM 2000).

CHAPTER 2
AREA PROFILE

The area profile describes the existing condition of resources and resource uses discussed in this AMS. This chapter incorporates information compiled at multiple levels to provide a context for the resources and their various uses. The BLM will use the information provided here as the basis for the Affected Environment chapter of the EIS.

2.1 LIVESTOCK GRAZING

History
Livestock grazing in the area dates back to the 1860s, with the number of cattle, sheep, and horses increasing rapidly until the early 1900s. Grazing use within the region has substantially decreased from its peak in the early part of the 20th Century. Livestock grazing became a regulated and permitted activity on National Forest System lands in the decade prior to World War I. In contrast, non-forest federal land was treated as a commons in which those who moved their stock onto the range first each season secured the use of new forage growth.

Stock from across the region were brought to graze during the winter, and many animals were left on the range year-round. This period of unregulated use and overgrazing resulted in impacts on rangeland resources and ecological conditions, especially at lower elevations used for winter grazing. The passage of the Taylor Grazing Act in 1934 secured federal control of the winter ranges. During the following years, the federal government established regulations pertaining to operators, allotments, kind and number of livestock, and season-of-use on public land. During the late 1950s and early 1960s, the BLM completed range surveys to determine the capacity of the land for grazing. Following these surveys, the BLM adjudicated decisions on forage and reduced livestock numbers on most allotments.

A federal court order on April 11, 1975, required the BLM to prepare grazing EISs during a 10-year period. To comply with this order, the BLM conducted range suitability analyses and field surveys on grazing capacity between 1975 and 1979. In 1981, the BLM issued the Kanab/Escalante Grazing Final EIS and began making adjustments in number and season-of-use of livestock. The EIS allocated 68,298 animal unit months (AUMs) to livestock initially and 91,444 AUMs upon full implementation of the plan, which was identified as being 24 years later (2005).

The increase in forage production was to be achieved by increasing production of desirable vegetation, improving watershed conditions and wildlife habitat, and with vegetation treatments and rangeland developments such as fences and water developments (BLM 1981). It should be noted that the planning area for the 1981 EIS included lands outside of the decision area for this MMP-A/EIS.

The State of Utah School and Institutional Trust Lands Administration formerly managed approximately 175,000 acres within GSENM. These lands were exchanged between the State of Utah and the federal government in 1998. Most of the former state lands transferred to the BLM are grazed in conjunction with the original BLM allotments through exchange of use agreements. Some of the transferred lands are fenced square miles that are managed as individual allotments. In accordance with the Congressional legislation authorizing the exchange, the BLM managed former state grazing permits under their original (state-issued) terms and conditions until they expired (Utah Schools and Land Exchange Act of 1998; Public Law 105-335).

The BLM authorizes livestock grazing in the decision area via leases and permits. These specify the grazing preference and the terms and conditions under which permittees make grazing use during the term of the lease or permit. Grazing preference is the total AUMs on public lands apportioned to a lease or permit. It includes the active use (the AUMs available for livestock grazing) and suspended use (the AUMs that are not available for livestock grazing). When GSENM was designated in 1996, there were approximately 77,400 active AUMs. Actual use in 1996 was approximately 51,900 AUMs, or 67 percent of active preference.

Range Improvements

Range improvements are physical modification or treatment of rangelands designed to improve forage production; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; or restore, protect, and improve the condition of rangeland ecosystems.

There are two categories of range improvements: nonstructural and structural. Nonstructural range improvements are seedings and other vegetation treatments; structural range improvements are fences, corrals, stock trails, cabins, cattle guards, and water developments. In general, the BLM would not authorize a water development without a supporting water right held by the US (Instruction Memorandum [IM] UT-2015-019).

Existing rangeland seedings were originally completed throughout the planning area to provide forage for livestock, to reduce erosion, and to enhance watershed functionality. A rangeland seeding is a type of nonstructural range improvement where a vegetation type or community has been established through the artificial dissemination of seed and via clearing away existing vegetation, typically. The original seedings were typically monocultures of crested wheatgrass or Russian wildrye. Seedings consist of a mixture of native and nonnative species that include shrubs, forbs, and grasses.

In some cases, seedings were established to help improve the management of nearby resources. For example, in order to keep cattle out of riparian areas, some areas have been treated to provide palatable forage outside of the riparian zone. Currently, vegetation treatments in

seedings are primarily intended to restore vegetation communities and habitat or to manage livestock use. The BLM has completed nonstructural range improvements on approximately four percent of the decision area. The BLM maintains these seedings, although some have failed in the Upper Paria, Last Chance, Circle Cliffs, Vermilion, Mollies Nipple, Coyote, Cottonwood, and Headwaters allotments. The BLM has treated some of the failed seedings in order to restore them, with varying levels of success. The BLM bases current forage allocations on the presence and maintenance of these seedings.

The BLM authorizes most range improvements through a cooperative range improvement agreement, as outlined in 43 CFR, Part 4120.3-2. Improvements authorized through such an agreement are permanent range improvements or rangeland developments (structural or nonstructural) needed to achieve management or resource condition objectives. Range improvements authorized under a cooperative range improvement agreement up to August 21, 1995, may be co-owned by the US government and the permittee; those issued after August 21, 1995, are owned by the US government alone. The costs of installing, maintaining, or modifying the improvements may be shared by the US government and the permittee, as specified in the cooperative range improvement agreement.

The BLM also authorizes range improvements through a range improvement permit, as outlined in 43 CFR, Part 4120.3-3. Improvements authorized through such a permit are needed to achieve management objectives for the allotment in which the permit or lease is held. Such improvements are removable or temporary, such as livestock handling facilities (e.g., corrals, creep feeders, and loading shuts) and troughs. The permittee owns range improvements issued under a range improvement permit and is generally responsible for maintaining such improvements.

In Glen Canyon, nonstructural range improvements, land treatments, and new line shacks are not permitted, according to the 1993 Interagency Agreement between the BLM and NPS for grazing management. Other range improvements could be permitted, subject to the NPS Organic Act, the Glen Canyon enabling legislation, and the Glen Canyon GMP. The NPS Superintendent first must complete a determination regarding the potential effects of the proposed action on the values and purposes of Glen Canyon.

Rangeland Health Standards

The regulations at 43 CFR, Part 4180 (developed by the Secretary of the Interior on February 22, 1995) indicate that the BLM must ensure that the following four Fundamentals of Rangeland Health exist on BLM lands:

1. Watersheds are in, or making significant progress toward, properly functioning physical condition, including their upland, riparian–wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, and timing and duration of flow.
2. Ecological processes, including the hydrologic cycle nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

3. Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving established BLM management objectives such as meeting wildlife needs.
4. Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal proposed, Category 1 and 2 Federal candidate, and other special status species.

The BLM Utah adopted Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah in 1997 that are to be applied to all BLM rangelands in Utah. The BLM uses information gathered through rangeland monitoring (i.e. trend), *Interpreting the Indicators of Rangeland Health*, proper functioning condition (PFC) assessments, water quality sampling, and other resource assessments by staff specialists to evaluate whether allotments are meeting the BLM Utah Standards for Rangeland Health. The four rangeland health standards are described below.

<u>Standard 1:</u> Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform. As indicated by:

a) Sufficient cover and litter to protect the soil surface from excessive water and wind erosion, promote infiltration, detain surface flow, and retard soil moisture loss by evaporation.
b) The absence of indicators of excessive erosion such as rills, soil pedestals, and actively eroding gullies.
c) The appropriate amount, type, and distribution of vegetation reflecting the presence of 1) the desired plant community, where identified in a land use plan conforming to these Standards, or 2) where the desired plant community is not identified, a community that equally sustains the desired level of productivity and properly functioning ecological conditions.

<u>Standard 2:</u> Riparian and wetland areas are in properly functioning condition. Stream channel morphology and functions are appropriate to soil type, climate, and landform. As indicated by:

a) Streambank vegetation consisting of, or showing a trend toward, species with root masses capable of withstanding high stream flow events. Vegetative cover adequate to protect streambanks and dissipate stream flow energy associated with high water flows, protect against accelerated erosion, capture sediment, and provide for groundwater recharge.
b) Vegetation reflecting: desired plant community, maintenance of riparian and wetland soil moisture characteristics, diverse age structure and composition, high vigor, large woody debris when site potential allows, and providing food, cover, and other habitat needs for dependent animal species.
c) Revegetating point bars; lateral stream movement associated with natural sinuosity; channel width, depth, pool frequency and roughness appropriate to landscape position.

d) Active floodplain.

Standard 3: Desired species, including native, threatened, endangered, and special status species, are maintained at a level appropriate for the site and species involved. As indicated by:

a) Frequency, diversity, density, age class, and productivity of desired native species necessary to ensure reproductive capability and survival.

b) Habitats connected at a level to enhance species survival.

c) Native species reoccupy habitat niches and voids caused by disturbances unless management objectives call for introduction or maintenance of nonnative species.

d) Habitats for threatened, endangered, and special status species managed to provide for recovery and move species toward de-listing.

e) Appropriate amount, type, and distribution of vegetation reflecting the presence of 1) the desired plant community, where identified in a land use plan conforming to these Standards, or 2) where the desired plant community is not identified, a community that sustains the desired level of productivity and properly functioning ecological processes.

Standard 4: The BLM will apply and comply with water quality standards established by the State of Utah (R.317-2) and the Federal Clean Water and Safe Drinking Water Acts. Activities on BLM-managed lands will fully support the designated beneficial uses described in the Utah Water Quality Standards (R.317-2) for surface and groundwater. As indicated by:

a) Measurement of nutrient loads, total dissolved solids, chemical constituents, fecal coliform, water temperature and other water quality parameters.

b) Macro-invertebrate communities that indicate water quality meets aquatic objectives.

Assessing Resource Conditions and Evaluating Rangeland Health

Range management is an adaptive process where ongoing grazing is appraised through monitoring, then modified, and then re-appraised. Monitoring to assess whether the level of use is sustainable and whether other resource objectives are being met can assist in determining the effectiveness of a grazing system. Because livestock and wildlife grazing affects vegetation vigor, the BLM monitors vegetative community trend to determine if site-specific vegetative objectives are being met. The level and frequency of monitoring by allotment varies across the planning area. The BLM categorizes allotments into I (Improvement), M (Maintenance), and C (Custodial). Generally, allotments in category I require more frequent monitoring than allotments in the other categories. Since 2000, the BLM has monitored or assessed more than 500 upland sites on approximately 360 miles of streams (i.e., lotic reaches) and at more than 100 seeps/springs (i.e., lentic sites).

Additional assessments are required on NPS-managed lands in Glen Canyon where GSENM administers grazing permits. This is to ensure that park resources remain unimpaired, in accordance with the Organic Act, the Glen Canyon enabling legislation, NPS Management Policies, and the goals and objectives identified in the Glen Canyon GzMP (NPS 1999).

Utilization

Utilization measurements estimate the amount of vegetation removed during a grazing period. The measurements do not indicate whether this use has a negative or positive effect on the forage resource. The BLM measures utilization using key species (referred to as the Key Species Method in Interagency Technical Reference TR-1734-3, Utilization Studies and Residual Measurements [Forest Service and BLM 1996]), which may vary by allotment or pasture.

Trend

The BLM uses two methods to monitor long-term trend within the planning area. One is called the photo plot method and the other is called frequency method. Both methods provide information as to the trend of the observed plant community. In addition, there are two different types of frequency method that have been used in GSENM: the quadrat and nested frequency. Trend is a transition toward or away from management goals or desired plant community. GSENM is currently implementing updated BLM monitoring which combines historic frequency monitoring with the Assessment, Inventory, and Monitoring (AIM) method. The AIM method includes a broader suite of monitoring protocols.

Assessment, Evaluation, Determination

In accordance with BLM Handbook H-4180-1, Rangeland Health Standards (BLM 2001), and IM 2009-007, the BLM, including GSENM, uses the following procedures for evaluating land health, making determinations, and developing appropriate actions that will make significant progress toward achieving land health standards developed in accordance with 43 CFR, Subpart 4180.2(c). For allotments administered by GSENM in Glen Canyon, the NPS is involved in developing and reviewing the evaluation report and determination document. It may take different actions than the BLM in order to meet agency requirements.

The following summary of the evaluation process is primarily meant to describe the process for BLM-managed lands.

<u>Evaluation Report – Assessing Land Health</u>

1. Identify assessment areas to be evaluated for achievement of land health standards. The evaluation should be completed primarily at higher levels such as watersheds, landscapes, and groups of allotments.
2. Prioritize areas for evaluation. Direction for selecting the area to be assessed and evaluated is provided in Chapter III of BLM Handbook H-4180-1, Rangeland Health Standards (BLM 2001).
3. Assemble existing information e.g., monitoring data, inventory data, and actual use information.
4. Evaluate data to ascertain whether land health standards are achieved. If additional information is needed to draw conclusions about the achievement of standards, use Technical Reference 1734-6, Interpreting Indicators of Rangeland Health (Pellant et al. 2005), or collect additional monitoring data.
5. Prepare an evaluation report to document whether land health standards are achieved. The report can be helpful to identify the appropriate action needed to make significant progress toward achieving the standards where they are not met.

NPS also uses long-term quantitative monitoring plot data.

If all land health standards are achieved or the status of some are unknown, no determination document needs to be completed. BLM Handbook H-4180-1 (BLM 2001) gives general guidance for size, compatibility, continuity, and appropriate scale for conducting assessments. It also gives the BLM Authorized Officer discretion in selecting assessment unit boundaries and priorities. There may be a number of small areas that the BLM has not assessed but that the BLM Authorized Officer determined were not significant enough to be assessed. The BLM does not determine whether these areas achieve or do not achieve standards, but they may be included in a larger more significant unit (pasture or allotment) found to be achieving or not achieving land health standards.

Between 1999 and 2006, the BLM completed assessments for approximately 75 percent of the geographic area of each pasture of each allotment. It based these assessments on soil mapping units, ecological site descriptions, or range site descriptions. At the discretion of the interdisciplinary team, the BLM assessed additional areas above the 75 percent level if livestock frequently used those areas.

The evaluation report must clearly state the rationale for finding that standards are achieved. The evaluation report will include identification of the area evaluated, a reference to information sources used in the evaluation, a summary of the data used to ascertain whether standards are achieved, a list of standards and/or objectives evaluated, indicators used to evaluate whether standards are achieved, and conclusions drawn by the interdisciplinary team.

If the evaluation report documents that standards are not achieved in the assessment area, then the BLM Authorized Officer needs to determine significant causes for non-achievement. If existing grazing management practices or levels of grazing use on public land are significant factors, then an appropriate action must be developed and implemented in accordance with 43 CFR, Subpart 4180.2(c).

On NPS-managed lands, modifications to grazing administration may be considered if such changes would help protect park resources and values in response to factors that are beyond management control, such as drought.

The following process is used to determine and document causal factors in assessment areas where land health standards are not achieved and to select the appropriate action to take when existing grazing management or levels of grazing use are significant factors for not achieving the standard(s).

Determination Document – Identifying Causal Factors

1. Review the condition(s) that results in finding that standard(s) are not met.
2. Ascertain whether the trend is toward achievement of the land health standard. If the apparent trend is determined without monitoring data, the interdisciplinary team must document the indicators and rationale for the conclusion on the trend. A conclusion regarding the trend needs to be related to the standard(s) not achieved.

3. Review the uses and levels of use made in the area that is not achieving standards. Review existing grazing management practices for conformance with guidelines developed by BLM state directors in consultation with resource advisory councils, in accordance with 43 CFR, Subpart 4180.2. In order to determine if other activities are significant factors for not achieving land health standards, review other activities for conformance with or deviation from appropriate management practices for those activities.
4. As directed in H-4180-1 Chapters III and VI, coordinate and consult with the permittee(s) and interested parties to identify changes in existing grazing management or other activities that would make significant progress toward achieving land health standards. Several possible actions may produce a desirable outcome; analyze these alternatives in a NEPA document to identify which action is the most helpful. The purpose and need statement in the NEPA document will indicate that the need is to achieve land health standards, and that the purpose of the proposed action and alternatives analyzed is to make significant progress toward achievement of the standard(s).
5. Incorporate this analysis information into the determination document.

Once the determination document is completed, the BLM Authorized Officer issues decisions to change management as necessary. If existing grazing management or levels of grazing use are determined to be significant causal factors for not achieving land health standards, the BLM Authorized Officer will take appropriate action by issuing a decision to modify grazing, construct management facilities, or implement treatments in accordance with 43 CFR, Part 4160. As described in BLM IM 2002-124, “appropriate action” under 43 CFR, Part 4180.2(c) has been taken when the decision to implement the action is issued. If the significant causal factors are a result of BLM-authorized activities other than grazing, the BLM Authorized Officer will take action to correct the situation in accordance with regulations applicable to that activity.

If the causal factor is an activity or event outside of BLM’s control, no action is required. However, this may provide an opportunity to coordinate and cooperate to achieve management that will remedy the factors causing the land health standards to not be achieved on public land. In addition, monitor to determine if significant progress toward meeting the standard(s) is occurring. On NPS-managed lands, action would be taken to alleviate unacceptable impacts, even if the causal factor is an activity or event outside of the BLM’s or NPS’s control.

In summary, a determination document will be completed only where land health standards are documented as “not achieved” in the evaluation report. Determination documents shall not be signed for areas identified as not meeting standards until the causal factor(s) are listed, conformance with grazing administration guidelines or appropriate management practices for other activities have been reviewed, and, where needed, potential appropriate action(s) are identified. Monitoring to determine if actions taken are resulting in significant progress toward achieving the standard(s) is a high priority. Monitoring is related to the indicators that were used to ascertain non-achievement.

Current Condition

There are 95 allotments in the decision area. Of the 95 allotments in the decision area, 19 allotments (approximately 318,800 acres) are wholly or partially within Glen Canyon (see Figure 2-1, Livestock Grazing Allotments). The BLM administers the permits on these allotments per the enabling legislation for Glen Canyon and by means of a memorandum of understanding and interagency agreement between the BLM and the NPS (see Section 5.5, Glen Canyon Enabling Legislation and Values and Purposes).

Twenty-one allotments (65,500 acres) are wholly or partially within the BLM Kanab Field Office. It made allocation decisions related to the availability of the allotments in the 2008 Kanab Field Office RMP (BLM 2008b), but GSENM manages the permits for the allotments. The MMP-A/EIS will not make a decision for the Kanab Field Office allotments because that decision was made in the 2008 Kanab RMP. The Sink Holes allotment (2,300 acres) is partially within the BLM Arizona Strip Field Office. The BLM GSENM has decision-making authority for allocation decisions related to this allotment and also administers the permit. Rock Reservoir and Coyote allotments in GSENM are administered by the BLM Arizona Strip Field Office. See Figure 2-1, Livestock Grazing Allotments.

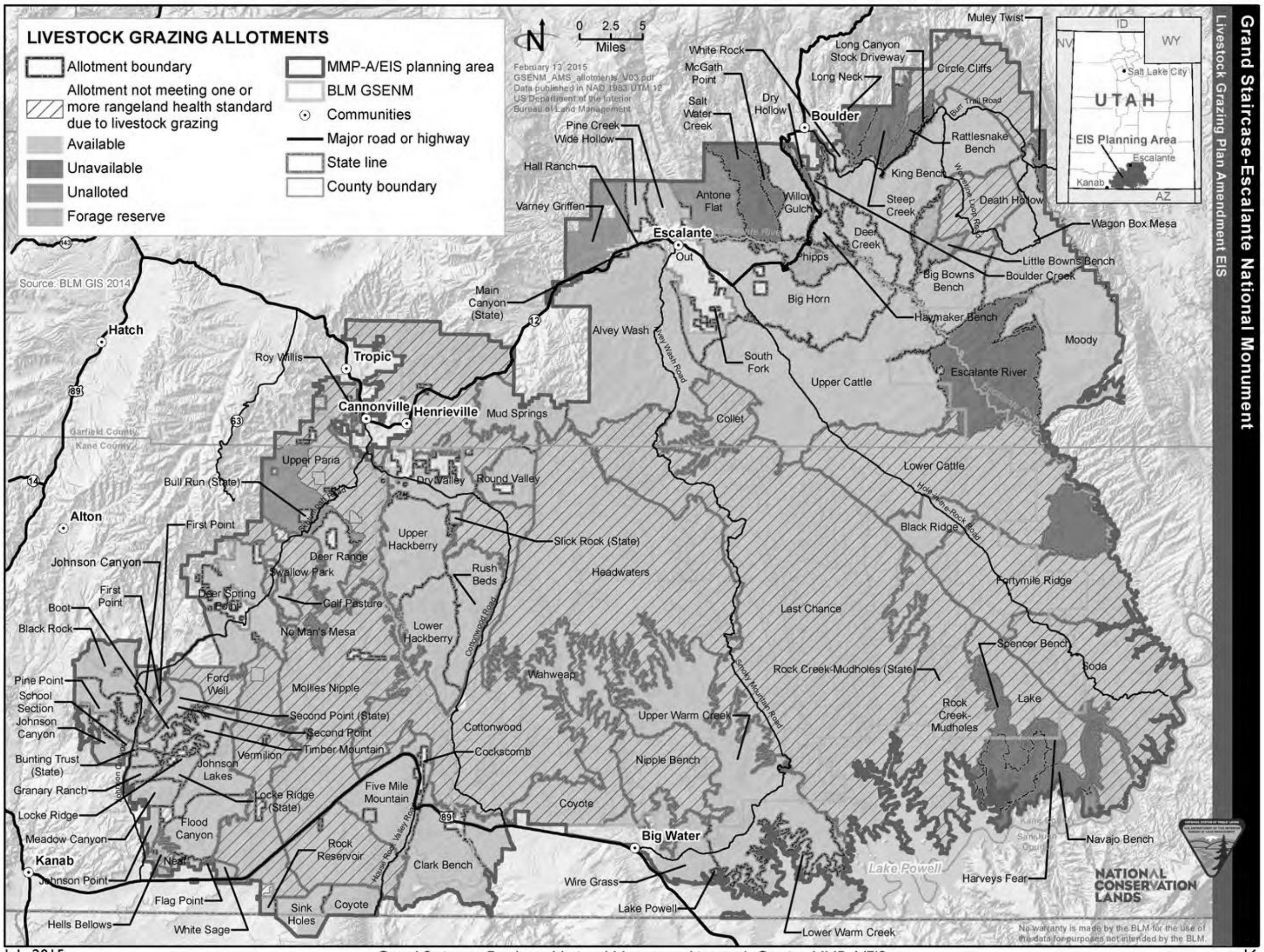
The total grazing preference in the decision area is 106,202 AUMs, which includes 76,957 active AUMs (including from forage reserves) and 29,245 suspended AUMs. See Table 2-1, Summary of Livestock Grazing Allocations, for acres available and unavailable by administrative unit and a summary of AUMs.

Seventeen of the 95 allotments in the decision area, totaling 139,400 acres, are wholly or partially unavailable to livestock grazing. This includes 88,600 acres in Glen Canyon. An additional 32,943 acres are unalloted for livestock grazing, including 1,600 acres in Glen Canyon. Table 2-2, Allotments Unallotted or Unavailable for Livestock Grazing, displays the allotments or the portions of allotments that have no active grazing use.

Of the allotments that are available for livestock grazing, 79 have active permits. There are 91 permittees authorized to graze cattle and horses on the 79 active allotments. Little Bowns Bench allotment (130 AUMs), the Wolverine pasture of the Deer Creek allotment (148 AUMs), and the Phipps pasture of Phipps allotment (140 AUMs) total 14,600 acres designated as forage reserves (BLM 1999) and together can supply up to 418 AUMs in emergency situations. No 10-year permit is issued to a holder of preference for these areas. Four allotments (Antone Flat, Long Canyon Stock Driveway, Varney Griffin, and an area in Glen Canyon) do not have an associated grazing preference. A total of 2,102,900 acres are available for livestock grazing.

Table 2-3, Active Allotments Available for Livestock Grazing and Associated Use, displays the active use, the associated season of use, and the actual use between 1996 (when GSENM was established) and 2013 (the most recent year of data collected and processed) for each of the 79 active allotments available for livestock grazing. Actual use means where, how many, and what kind or class of livestock and how long livestock graze on an allotment or on a portion or pasture of an allotment (43 CFR, Part 4100.0-5). This information is a required submittal by the permittee at the end of the season of use of the allotment.

Figure 2-1



Grand Staircase-Escalante National Monument
Livestock Grazing Plan Amendment EIS
LIVESTOCK GRAZING ALLOTMENTS
Allotment boundary
Allotment not meeting one or more rangeland health standard due to livestock grazing
Available
Unavailable
Unalloted
Forage reserve
MMP-A/EIS planning area
BLM GSENM
Communities
Major road or highway
State line
County boundary
N
0 2.5 5
Miles
Source: BLM GIS 2014
UTAH
EIS Planning Area
Salt Lake City
Escalante
Kanab
ID
WY
NV
AZ
Muley Twist
Long Canyon Stock Driveway
Circle Cliffs
White Rock
McGath Point
Long Neck
Salt Water Creek
Dry Hollow
Boulder
Rattlesnake Bench
Pine Creek
Wide Hollow
King Bench
Hall Ranch
Antone Flat
Willow Gulch
Steep Creek
Death Hollow
Varney Griffen
Wagon Box Mesa
Escalante
Out
Deer Creek
Phipps
Little Bowns Bench
Big Bowns Bench
Boulder Creek
Main Canyon (State)
Big Horn
Haymaker Bench
Hatch
Alvey Wash
Moody
Roy Willis
Tropic
South Fork
Escalante River
Upper Cattle
Cannonville
Henrieville
Mud Springs
Collet
Garfield County
Kane County
Upper Paria
Lower Cattle
Bull Run (State)
Dry Valley
Round Valley
Alton
Black Ridge
First Point
Slick Rock (State)
Johnson Canyon
Upper Hackberry
Deer Range
Rush Beds
Headwaters
Swallow Park
Fortymile Ridge
Deer Spring Point
Boot
Calf Pasture
Last Chance
Black Rock
No Man's Mesa
Lower Hackberry
Spencer Bench
Ford Well
Wahweap
Rock Creek-Mudholes (State)
Soda
Pine Point
Mollies Nipple
School Section
Second Point (State)
Upper Warm Creek
Rock Creek-Mudholes
Lake
Johnson Canyon
Second Point
Cottonwood
Timber Mountain
Cockscomb
Bunting Trust (State)
Vermilion
Nipple Bench
Johnson Lakes
Granary Ranch
Locke Ridge (State)
Five Mile Mountain
Coyote
Locke Ridge
Flood Canyon
Big Water
Navajo Bench
Meadow Canyon
Rock Reservoir
Kanab
Neaf
Clark Bench
Lake Powell
Johnson Point
Wire Grass
Harveys Fear
Flag Point
Sink Holes
Coyote
Lake Powell
Hells Bellows
White Sage
Lower Warm Creek
NATIONAL CONSERVATION LANDS

Table 2-1
Summary of Livestock Grazing Allocations

Summary of Acres	Acres
Total Acres Available for Livestock Grazing	2,102,900
GSENM	1,804,900
Glen Canyon	230,200
Kanab Field Office	65,500
Arizona Strip Field Office	2,300
Unavailable for Livestock Grazing	139,400
GSENM	50,800
Glen Canyon	88,600
Kanab Field Office	0
Arizona Strip Field Office	0
Summary of AUMs for Decision Area	**AUMs**
Total Grazing Preference	106,202
Active AUMs	76,957
Suspended AUMs	29,245
Allotments Partially or Wholly in Glen Canyon	**Acres in Glen Canyon (Total Acres)**
Big Bowns Bench	4,136 (18,568)
Escalante River	57,880 (59,292)
Fortymile Ridge	17,928 (57,905)
Harveys Fear	2,374(4,293)
Lake	5,113 (22,741)
Lake Powell	367 (367)
Last Chance	22,566 (250,120)
Lower Cattle	18,466 (81,350)
Lower Warm Creek	15,920 (15,920)
Moody	27,142 (43,272)
Navajo Bench	12,775 (12,935)
Nipple Bench	492 (30,459)
Rock Creek-Mudholes	33,720 (76,769)
Soda	52,146 (70,445)
Spencer Bench	3,303 (8,544)
Unalloted (NPS)	1,608 (1,608)
Upper Cattle	7,504 (92,420)
Upper Warm Creek	22,384 (77,363)
Wagon Box Mesa	688 (28,995)
Wire Grass	12,286 (19,865)

Source: BLM GIS 2014b

Table 2-2
Allotments Unallotted or
Unavailable for Livestock Grazing

Allotment (Pasture)	Acres
Unalloted Allotments	
Antone Flat	15,041
Long Canyon Stock Driveway	1,043
Varney Griffin	15,251
Unalloted (NPS)	1,608
Total	*32,943*
Unavailable Allotments	
Big Bowns Bench (River pasture* and a portion of Horse Canyon pasture)	1,729
Deer Creek (Cottonwood and River pastures)	5,170
Dry Hollow	1,276
Escalante River*	59,292
Flag Point	322
Harvey's Fear*	4,293
Long Neck	225
McGath Point	3,132
Muley Twist	2,247
Navajo Bench*	12,935
No Man's Mesa	1,464
Phipps (River Pasture)	3,066
Rattlesnake Bench	3,564
Rock Creek-Mudholes (Dry Rock Creek and Middle Rock Creek pastures)*	11,895
Saltwater Creek	12,055
Spencer Bench*	8,544
Steep Creek	7,550
Willow Gulch (Lower Calf Creek Falls pasture)	673
Total	*139,432*

Source: BLM allotment summaries; BLM GIS 2014b
*Allotment partially or wholly in Glen Canyon

Table 2-3
Active Allotments Available for Livestock Grazing and Associated Use

Allotment	Season of Use	Acres in Decision Area	Active Use (AUMs)	Actual Use[1] (AUMs) 5-year Average 1996-2000	2001-2005	2006-2010	2011-2013[2]	18-year Average (1996-2013)
Alvey Wash	May 15 September 30	60,185	1,424	1,144	746	682	278	761
Big Bowns Bench*	November 1 March 31	16,839	750	857[3]	*Nonuse*	*Nonuse*	*Nonuse*	190[3]
Big Horn	November 1 June 15	50,215	3,515	2,426	1,366	1,102[3]	2,298[3]	1,710[3]
Black Ridge	November 1 May 31	11,657	903	438	390	315	309[3]	372[3]
Black Rock	June 6 October 16	9,310	408	758	651[3]	153[3]	142[3]	458[3]
Black Rock (State)	June 6 October 16	1,251	64	*(actual use averages are included in the Black Rock section)*				
Boot	August 1 October 31	2,675	45	45	29[3]	42	45	40[3]
Boulder Creek	September 1 December 31	3,251	80	48[3]	26[3]	8[3]	11[3]	25[3]
Bull Run (State)	July 1 February 28	631	5	*No use of the allotment sine acquired by the BLM in 1998.*				
Bunting Trust (State)	May 15 November 30	226	16	10[3]	11	17	13	13[3]
Calf Pasture	June 10 August 10 *(even years)* August 10 October 15 *(odd years)*	2,775	176	67	34	76	51	58
Circle Cliffs	November 1 March 31	30,212	1,050	842	43	402	831	476[3]
Clark Bench	November 1 April 30	25,170	1,238	894	330	344	226	473
Cockscomb	March 1 May 31	2,753	36	14	18	8	16	14
Collet	June 16 September 15	16,723	97	95[3]	72	84	57	75[3]
Cottonwood	November 1 May 31	103,326	3,188	2,656	1,692	2,121	2,347[3]	2,179[3]
Coyote	November 1 May 31	32,636	2,044	1,594	650	1,331	889[3]	1,156[3]
Death Hollow	November 1 March 31 April 1 May 15	19,538	1,057	607	210	541	557[3]	465[3]
Deer Creek	November 1 February 28	8,991	358	344	103	45	92	152
Wolverine Pasture (forage reserve)	October 1 March 31	3,816	148				117	
Deer Range	August 1 October 15	11,107	231	194		42	122	109
Deer Spring Point	June 10 October 17	24,986	585	499	229	164	229	286
Dry Valley	March 1 December 31 March 1 January 31 July 1 October 31	11,448	699	672	449	576	621	575

Table 2-3
Active Allotments Available for Livestock Grazing and Associated Use

Allotment	Season of Use	Acres in Decision Area	Active Use (AUMs)	Actual Use[1] (AUMs) 5-year Average 1996-2000	2001-2005	2006-2010	2011-2013[2]	18-year Average (1996-2013)
First Point	June 1 December 31	3,015	410	132	69	41	*Nonuse*	81
Five Mile Mountain	November 1 April 30	17,848	385	380	51	13	*Nonuse*	102
Flood Canyon	July 1 October 31	13,576	148	63	22	30	48	40
Ford Well	June 10 October 9	9,088	300	256	242	44	254[3]	170
Fortymile Ridge*	October 15 May 31	57,905	4,290	2,582	1,291	3,713	2,416[3]	2,515[3]
Granary Ranch	July 1 November 30	1,905	70	7	41	30	45	38
Hall Ranch	March 1 February 28	34	12	*Nonuse*[3]	*Nonuse*	11.5[3]	6[3]	6[3]
Haymaker Bench	November 1 February 28	3,150	100	58	70	61	76[3]	65[3]
Headwaters	November 1 March 15	154,436	3,469	3,393	1,981	1,991	2,373	2,441
Hells Bellows	May 1 October 15	2,132	44	44	32	35	42[3]	3
Johnson Canyon	June 1 November 15	10,121	274	165	111	67	142	119
Johnson Lakes	June 1 November 30	11,142	347	306	179	112	302	216
Johnson Point	November 1 March 31	2,344	135	*Nonuse*	10	*Nonuse*	*Nonuse*	3
King Bench	November 1 March 31	54,328	1,515	1,144	980	311	1,281[3]	867[3]
Lake*	June 1 September 30	22,741	1,310	1,116	80	485	316	520
Lake Powell*	October 15 March 15	367	20			*Nonuse*		
Last Chance*	March 1 February 28	250,120	4,642	2,672	1,015	967	928	1,448
Little Bowns Bench (forage reserve)	October 1 March 31	3,422	130				141	
Locke Ridge	December 1 April 30	4,456	172	118	134	78[3]	91[3]	110[3]
Lower Cattle*	October 1 April 15	81,350	7,488	4,680	3,514	5,294	4,372[3]	4,481[3]
Lower Hackberry	October 15 March 15	20,173	435	222	67	152	326	1
Lower Warm Creek*	November 1 March 31	15,920	225	80	100	*Nonuse*	13	5
Main Canyon	June 1 September 30	312	14	8[3]	10	53	5	22[3]
Meadow Canyon	September 1 November 30	4,681	144	135	103	79[3]	92	108[3]
Mollies Nipple	March 1 February 28	102,361	3,880	3,785	2,784	2,874	2,778[3]	3,104[3]
Moody*	November 1 March 31	43,272	909	712	391	270	270[3]	446[3]
Mud Springs	July 15 October 15	15,652	277	214	200	79	99	153
Neaf	March 1 November 30	1,287	9	7	*Nonuse*	2	*Nonuse*	3

Table 2-3
Active Allotments Available for Livestock Grazing and Associated Use

Allotment	Season of Use	Acres in Decision Area	Active Use (AUMs)	Actual Use[1] (AUMs)				
				5-year Average				18-year Average (1996-2013)
				1996-2000	2001-2005	2006-2010	2011-2013[2]	
Nipple Bench*	December 1 April 30	30,459	1,042	349	311	361	376[3]	345[3]
Phipps (Phipps pasture) (forage reserve)	October 1 March 31	7,365	140				122	
Pine Creek	September 16 October 31	3,804	144	60	78	7	158[3]	61[3]
Pine Creek (State)	November 1 January 31	592	27	*(actual use averages are included in the Black Rock section)*				
Pine Point	June 16 October 15	8,828	365	245	169	108	171	174
Rock Creek-Mudholes*	March 1 February 28	64,873	2,173	1,381	*Nonuse*	954	1,159[3]	823[3]
Round Valley	November 1 March 31	9,920	522	419	253	316	254	317
Roy Willis	November 1 March 15	195	9	2	4	4	9	4
Rush Beds	November 1 April 30	18,765	252	38	126	76	124[3]	81[3]
School Section	May 1 April 30	753	102	24	37	9	*Nonuse*	19[3]
Second Point	August 1 September 30	5,890	98	52	18	19[3]	12	28[3]
Sink Holes	November 1 April 1	6,589	154	110	*Nonuse*	8[3]	45[3]	42[3]
Slick Rock (State)	June 1 June 30	643	24	*Insufficient Data*	*Insufficient Data*	15	6	10[4]
Soda*	October 1 May 31	70,445	2,798	1,744	642	2,230	514[3]	1,418[3]
South Fork	March 1 February 28	118	12	*Nonuse*	*Nonuse*	9	8	4[3]
Swallow Park	May 1 October 31	16,494	1,076	621	509	514	379	520
Timber Mountain	June 16 October 15	7,662	426	287	223	174	128	211
Upper Cattle*	November 1 June 15	92,420	8,158	5,606	4,774	7,276	4,220	5,689
Upper Hackberry	November 1 March 31 April 16 June 15	22,835	654	472	270	217	190	304
Upper Paria	May 1 June 10 May 1 September 30	94,347	2,833	2,277	738	1,282	1,429	1,432
Upper Warm Creek*	November 1 May 31	77,363	1,638	364	401	682	490[3]	483[3]

Table 2-3
Active Allotments Available for Livestock Grazing and Associated Use

Allotment	Season of Use	Acres in Decision Area	Active Use (AUMs)	Actual Use[1] (AUMs) 5-year Average 1996-2000	2001-2005	2006-2010	2011-2013[2]	18-year Average (1996-2013)
Vermilion	February 16 February 28, 2014 March 1 May 15 June 1 September 15 October 1 January 15	43,084	2,849	2,080	1,104	416	814[3]	1,155[3]
Wagon Box Mesa*	November 1 March 31	28,995	637	267	248	201	217[3]	236[3]
Wahweap	December 1 April 30	17,222	491	361	206	224	372	276[3]
White Rock	December 1 January 31	1,389	60	55	47	23	*Nonuse*[3]	37[3]
White Sage	May 6 June 5	2,142	76	64	33	15	*Nonuse*	33
Wide Hollow	October 1 December 31	3,779	353	265[3]	118	354	295	253[3]
Willow Gulch	November 1 March 31 December 1 January 31	12,214	474	188	22	28	27[3]	73[3]
Wiregrass*	November 1 March 31	19,865	99	342	3	*Nonuse*	*Nonuse*	104

Sources: BLM 2014a; BLM allotment summaries
[1]Actual use is supplemented with billed use where actual use data is not available.
[2]2011-2013 actual use averages are for a 3-year period.
[3]Period includes years with nonuse. Some data for 2013 not available and not included in the averages.
[4]Based on 8-year average.
*Allotment partially or wholly in Glen Canyon

Livestock use is authorized at different times and seasons throughout the year. Season-of-use is largely determined by elevation. Generally, livestock graze the lower elevation allotments during the winter and spring, the mid-elevation allotments are grazed during the spring/fall season, and the high elevation allotments are grazed in the summer. The majority of livestock permittees do not graze in the decision area year-round. Most operators have their livestock on non-BLM-managed lands (such as National Forest System lands, private base property, or state lease) at least part of the year. Those allotments, which do have livestock use permitted year round, include pastures in which the livestock are rotated so livestock are not grazing on the same portion of the allotment yearlong. The annual stocking rate, based on the carrying capacity for each allotment, is typically determined before stock are turned out at the beginning of the season of use for each allotment.

The level of grazing use within the planning area continues to be at or below permitted (active use) levels. Some of the major factors that typically affect or determine the number of grazing livestock on an allotment on any given year are listed below.

1. Precipitation—The timing, intensity, and amount of precipitation received before livestock are turned out determines forage production more than any other factor in this area.
2. Temperature—Temperature can have a positive or negative effect on forage growth rates. For example, a cold, dry spring generally limits growth on cool season grasses. This relates to the concept of range readiness, which is a defined stage of plant growth at which grazing may begin without permanent damage to vegetation or soil.
3. Availability of livestock water or snow—This plays an important role in how long an area is used and when it is used. There can be plenty of forage, but if there is no available water, that area cannot be used.
4. Conservation—Protecting the rangeland is often a choice by permittees, who are familiar with their allotments and often recommend or suggest that an area or allotment should receive less grazing use.
5. Individual permittee's preference in relation to livestock operations—A permittee may decide for a number of reasons that he or she does not want to run allocated numbers in a particular year.
6. Restoration/revegetation work—At times, the BLM has asked that the permittees not graze an area or allotment while restoration work is taking place. This is usually documented in a signed agreement. The minimum lengths of time these areas have been rested is two growing seasons, but they may and have been rested longer, depending on resource objectives and condition.

In 1964, the BLM closed the Lower Calf Creek Falls pasture of the Willow Gulch allotment because of the construction of the Calf Creek recreation site and campground. The trail to the lower falls is used almost daily year-round and often has hundreds of visitors hiking to the falls during the high-use period. This is the highest concentrated recreation use area in GSENM.

The Harvey's Fear, Navajo Bench, and Spencer Bench areas are located on a relatively narrow bench between the top of Fiftymile Mountain and Lake Powell. They surround the southern tip of Fiftymile Mountain. These areas are difficult to access due to cliffs both above and below. Limited access, water, and forage make these areas unsuitable for grazing. The 1980 Grazing EIS and subsequent 1981 MFP both recommend continuing the closure.

The BLM closed the Muley Twist area located in the far northeast corner of the planning area to livestock grazing in 1981 due to management decision associated with Capital Reef National Park (BLM 1981a).

The BLM closed the Dry Rock Creek and Middle Rock Creek pastures (Rock Creek-Mudholes allotment) by decision in the MFP due to slope and topography, lack of access, and limited forage. Dry Rock Creek, the larger pasture, has mostly been cut off from other areas due to the formation of Lake Powell.

The BLM put the Dry Hollow allotment into nonuse through a decision in the 1981 Escalante MFP.

The BLM closed Rattlesnake Bench by decision in the MFP due to suitability issues including access, terrain, limited forage, and lack of water.

The BLM closed the portion of the Big Bowns Bench (698 AUMs), Deer Creek (83 AUMs), and Phipps (140 AUMs) allotments that were located partially in the Escalante River to grazing in the 1999 Escalante MFP amendment (BLM 1999). The BLM also closed the McGath Point, Salt Water Creek, and Steep Creek allotments and the Cottonwood pasture (Deer Creek allotment) to livestock grazing in the 1999 Escalante MFP amendment (BLM 1999). The reason for closure was to eliminate conflicts between recreational users and livestock and also to protect and enhance riparian, wildlife, fisheries, and watershed values of the Escalante River and some tributaries.

Forage Production

The rangeland suitability analyses conducted in the late 1970s in preparation of the Kanab-Escalante Grazing EIS identified lands suitable for livestock use. The BLM defined suitable rangeland as, "forage-producing land which can be grazed on a sustained-yield basis under an attainable management system. Suitable rangeland can be grazed without causing damage to the basic soil resource of the specific or adjacent areas" (BLM 1980, Appendix 9). Unsuitable rangelands were not given a carrying capacity, and no range improvements or actions to attract livestock were taken on unsuitable rangelands (BLM 1980, Appendix 9).

Since that time, the condition of the landscape, landownership patterns, and administrative boundaries have changed. The BLM will estimate forage available for livestock in this EIS based on updated calculations of forage production, as well as existing range monitoring information.

For the EIS, the BLM will consider factors such as distance from water sources, slope, soil erodibility, and potential for vegetation treatments in order to estimate total forage production and forage available for livestock.

Rangeland Health Standards

The BLM completed a GSENM-wide evaluation in 2006 to determine the status of rangeland health in each of the allotments. The BLM determined that 21 allotments were not meeting one or more rangeland health standards due to existing livestock grazing. Table 2-4, Allotments Not Meeting Rangeland Health Standards Due to Livestock Grazing in 2006, depicts which of the standards were not met for each of these allotments.

Table 2-4
Allotments Not Meeting Rangeland Health Standards[1] Due to Livestock Grazing in 2006

Allotment	Standard Not Met				Changes to Grazing Management[2]	Assessments Since 2006 Determinations
	1	2	3	4		
Circle Cliffs	X	X	X		1. Restoration of the Lampstand, Onion Beds, and Prospect pasture seedings (2,500 acres) 2. Limited grazing use in the Gulch pasture no later than March 15	Riparian assessments 2007, 2012
Collet		X	X		1. Increased use supervision to control unauthorized livestock 2. Coordinated 28 percent voluntary nonuse to meet BLM resource objectives (2007-2013)	Riparian assessments 2012
Cottonwood		X		X[3]	1. Upgrade and maintenance of the Coyote well, pipeline, and associated infrastructure 2. Jack Riggs and Butler Valley water systems maintained 3. Voluntary nonuse to limit use of the riparian pasture to trailing and/or emergency use 4. Restoration of the Eight Mile seeding and the associated nonuse agreements (2008-2009) 5. Solar pump installed on Butler Valley well (2012) 6. Two separate rotation systems implemented on an experimental basis	Riparian assessments 2007, 2010, 2014
Coyote	X		X	X[3]	1. Restoration of 2,634 acres (2009) 2. Upgrade and maintenance of the Coyote well, pipeline, and associated infrastructure	Restoration monitoring conducted annually for first five years after project completion
Death Hollow		X			1. 100 percent voluntary nonuse to meet BLM resource objectives (1 year 2006-2007). Voluntary nonuse during spring season (April 1-May 15) 2002-2006 and 2012 2. Cleaned and reconstructed stock ponds between Wolverine and Horse Canyon (2008)	Riparian monitoring 2012

Table 2-4
Allotments Not Meeting Rangeland Health Standards[1] Due to Livestock Grazing in 2006

Allotment	Standard Not Met				Changes to Grazing Management[2]	Assessments Since 2006 Determinations
	1	2	3	4		
First Point		X			1. Fenced First Point Spring to exclude livestock from the spring (2007) 2. Maintained offsite water at First Point Spring	Riparian assessments 2007
Ford Well		X			1. Fenced Old Corral Spring and Ford Well Spring to exclude livestock from the spring 2. Provided off site water at both springs improving distribution	Riparian assessments 2007
Fortymile Ridge[4]		X		X[3]	1. Coordinated 22 percent voluntary nonuse to meet BLM resource objectives (2006-2012) 2. Maintenance of spring protection fences (2008) 3. Maintenance of the Wilcox Spring protection fence 4. Returned a portion of the Wilcox Spring flow back to spring for recovery of riparian vegetation (2010) 5. Use of supplement to improve livestock distribution (2006 to present)	Riparian assessments 2007, 2014 Upland assessments 2014
Headwaters		X		X[5]	1. Implemented invasive weed management starting in 2001 2. Changed season of use in 1984 (off on March 15) 3. Limited livestock use in the Wahweap "Box" riparian area	Riparian assessments 2010, 2014
Hells Bellows		X			1. Coordinated 100 percent voluntary nonuse in 2007	Riparian assessments 2007
Lake[4]		X	X		1. Removed more than 80 feral cattle 2. Pasture and spring protection fences maintained 3. Complete nonuse of the allotment from 2001-2003 and 2007	Riparian assessment 2007
Last Chance[4]		X		X[5]	1. Coordinated 76 percent voluntary nonuse to meet BLM resource objectives (2006-2012) 2. Removed feral cattle from the allotment (2003-present) 3. Maintained exclosure fence around Relishen Seep (2005)	Riparian assessments 2010, 2014

Table 2-4
Allotments Not Meeting Rangeland Health Standards[1] Due to Livestock Grazing in 2006

Allotment	Standard Not Met				Changes to Grazing Management[2]	Assessments Since 2006 Determinations
	1	2	3	4		
Lower Cattle[4]		X	X		1. Coordinated 33 percent voluntary nonuse to meet BLM resource objectives (2006-2012) 2. Implemented a voluntary water-controlled, deferred rest rotation grazing system to better manage livestock distribution (2007-present) 3. Maintained stock ponds to improve water availability and distribution. 4. Use of supplement to improve livestock distribution (2006 to present). 5. Water based rotation/distribution	Riparian assessments 2007, 2014 Upland assessments 2014
Mollies Nipple	X	X	X		1. Restoration of three seeded pastures 2. Coordinated 27 percent voluntary nonuse to meet BLM objectives (2006-2012) 3. Adjustments to livestock use due to drought 4. Deferred rest rotation followed and administered 5. Maintenance of Seaman Wash pipeline (2007) 6. Fenced Wildcat Spring (2009). 7. Constructed water developments in the Buckskin pasture (Sink Hole and Buckskin catchments) 8. Maintained two stock ponds in Buckskin pasture 2007 9. Restoration work, fencing of springs	Riparian assessments 2010 Upland assessments 2014
Nipple Bench[4]		X		X[5]	Livestock grazing is not the causal factor for not meeting rangeland health standards. Road through riparian area is constricting ability to move toward meeting standards.	N/A
Rock Creek-Mudholes[4]		X		X	1. Removed more than 65 feral cattle (2006-2008) 2. Permittee removed more than 25 additional feral cattle (2009-present) 3. Maintained four spring fences 4. Maintained pasture fences 5. 100 percent nonuse to meet BLM resource objectives (2001-2006)	Riparian assessments 2015

Table 2-4
Allotments Not Meeting Rangeland Health Standards[1] Due to Livestock Grazing in 2006

Allotment	Standard Not Met 1	2	3	4	Changes to Grazing Management[2]	Assessments Since 2006 Determinations
					6. Coordinated partial voluntary nonuse (2007-present)	
School Section			X		1. 100 percent voluntary nonuse to meet BLM resources objectives (2007-2010). 2. Coordinated about 70 percent voluntary nonuse (2009-Present)	Upland assessments 2013
Soda[4]	X	X			1. Removed more than 45 feral cattle (2003-2004) 2. Maintained Cottonwood Spring protection fence (2010) 3. Maintained stock ponds and catchments (2011) 4. Maintained/improved Hole in the Rock well (2008) 5. 100 percent nonuse to meet BLM objectives (2002-2005) 6. Existing rotational grazing system avoids use after March 31 on consecutive years	Riparian assessments 2014 Upland assessments 2014
Swallow Park		X			1. Coordinated voluntary season-of-use restrictions deferring summer use and use during the critical spring growing season in the Bullrush Hollow pasture 2. Partial voluntary nonuse to meet BLM resource objectives (2001-2008)	Riparian assessments 2010
Upper Paria	X	X		X[3]	1. Repaired and maintained erosion control structures in the Mudholes pasture (2005) 2. Completed seeding restoration on 300 acres in the Mudholes and Upper Jim Hollow pastures (2005) 3. Coordinated 39 percent voluntary nonuse to meet BLM resource objectives (2003-2013) 4. Installed riparian spring protection fence at Between the Creeks Spring (2008) 5. Repaired and upgraded spring development and spring protection fence at Dick Ott Spring (2006) 6. Maintained and upgraded the Sheep Creek pipeline and cleaned Upper	Riparian assessments 2010

Table 2-4
Allotments Not Meeting Rangeland Health Standards[1] Due to Livestock Grazing in 2006

Allotment	Standard Not Met				Changes to Grazing Management[2]	Assessments Since 2006 Determinations
	1	2	3	4		
					Jim stock ponds (2006) 7. Installed 1-acre monitoring exclosure in Mudholes seeding and frequency/cover studies.	
Vermilion	X	X	X	X	1. Maintained Sand, Cole, and Nephi spring protection fences; restored spring boxes (2007) 2. Completed Seeding Restoration in RCA 1, RCA 2, RCA 3, and Fossil Wash pastures (2006) 3. Coordinated 81 percent voluntary nonuse to meet BLM resource objectives (2006- 2012) 4. Completed Sink Holes catchment in Government Reservoir pasture 5. Maintained Fossil Wash stock pond (2007)	Riparian assessments 2014 Upland assessments 2014

Source: BLM 2006
[1]Section 2.1 describes rangeland health standards.
[2]This list is not all-inclusive; it is intended to give the reader an indication of actions taken by the BLM and grazing permittees to make progress toward meeting rangeland health standards.
[3]Livestock grazing was determined not to be a cause in not meeting Standard 4.
[4]Allotment partially or wholly in Glen Canyon.
[5]Livestock grazing was determined to be a contributing factor in not meeting Standard 4.

For 19 of the 21 allotments not meeting rangeland health standards it was determined that "1) existing grazing management or levels of grazing use are significant factors in failing to achieve the [rangeland health standard(s)] or conform with the guidelines [for livestock grazing management] and 2) existing grazing management needs to be modified to ensure that the fundamentals of rangeland health are met, or making significant progress toward being met" (BLM 2006). While livestock grazing was determined to be part of the problem in not meeting one or more of the land health standards, it was not always the primary causal factor in not meeting all of the standards.

For the remaining two allotments not meeting rangeland health standards due to livestock grazing, existing grazing management or levels of grazing use was not a significant factor in failing to achieve the standards. The significant factors identified were past grazing practices (more than 10 years earlier than the evaluations) and the inability of the rangelands to recover from past grazing management or levels of use. However, in order to meet or make significant progress toward meeting the fundamentals of rangeland health, the BLM determined that existing grazing management should be modified.

Since the 2006 determination, additional PFC assessments have been conducted in the following allotments: Circle Cliffs, Collet, Cottonwood, Ford Well, Fortymile Ridge, Headwaters, Hells

Bellows, Last Chance, Lower Cattle, Mollies Nipple, Soda, Swallow Park, Upper Paria, and Vermilion. Additional upland assessments have been conducted in the School Section allotment. Overall, most of the riparian and wetland sites evaluated show an improvement. Assessments completed and changes to grazing management are described in Table 2-4.

Circle Cliffs Allotment. The actions taken on this allotment, such as the approximately 2,500 acres of vegetation treatments, have improved desired vegetative cover and composition, while reducing soil movement and erosion. This has resulted in progress toward meeting Standards 1 and 3. Limiting spring use in the Gulch has reduced livestock-related impacts, such as trampling and utilization of forage, during the critical spring growing season. This has resulted in progress toward meeting Standard 2 (2007, 2012 PFC assessments).

Collet Allotment. The actions taken on this allotment, such as voluntary nonuse and increased use supervision, have limited grazing impacts on the riparian area in the Right Hand Collet drainage such as trampling and bank shear. These actions have resulted in significant progress toward meeting riparian health standards, as exhibited by riparian vegetation recruitment, increased plant vigor, and bank continuity.

Increased use supervision and management on the Collet allotment is a change from past practices. Improved management practices, including fence maintenance, have assisted in proper livestock control, providing improved riparian management and progress toward meeting standards.

Voluntary nonuse (28 percent) by the permittee has provided for proper levels of use of available forage. Reduced levels of use have improved vegetation conditions (cover, diversity, and vigor) and made progress toward meeting Standard 2 (2012 PFC assessments). In 2012, full numbers were authorized on the allotment, and utilization data for key species was found to be in the Light Use Category (21 to 40 percent). This indicates that current authorized use numbers can provide for the continued recovery and integrity of the biotic community.

Cottonwood Allotment. The actions taken on this allotment have improved cattle distribution and reduced grazing impacts on riparian areas. The BLM has implemented all of the actions identified in the 2006 Rangeland Health Determination plus has installed a solar pump on the Butler Valley well. Project work has provided for rotational grazing and lessened the dependency on the Paria River and Cottonwood drainages as water sources. The BLM has treated 1,174 acres of seeding and sagebrush for rehabilitation. The BLM and permittees actions, such as improving the Coyote pipeline and limiting grazing in the Paria River and Cottonwood Creek riparian corridors, have reduced impacts on riparian areas and increased recovery periods. This has improved resource conditions and made progress toward achieving Standard 2 (2007, 2010, and 2014 PFC assessments). Standard 4 was not met due to natural background geologic and physiographic conditions unrelated to livestock grazing.

Coyote Allotment. The actions taken on this allotment, such as 2,634 acres of vegetation treatment and restoration, have improved desired vegetative cover, composition, and diversity. Soil stability has also been improved, as evident in reduced soil movement and erosion, resulting in progress toward meeting Standards 1 and 3. Standard 4 was evaluated as not being met due to natural geologic sources; this is not an issue that BLM can resolve through management.

Death Hollow Allotment. The BLM has worked with the permittee to rest or defer use in 7 of the last 12 years. Consecutive nonuse for five years (2002 to 2006) has resulted in improved riparian conditions. An additional year of nonuse (2012) has also provided for recovery of the riparian area to maintain its condition. The permittee has agreed to implement a rotational deferment of the spring use on the allotment. Periodic growing season rest (deferment) is a common strategy of grazing systems. It can provide sufficient growth and recovery for systems, while improving or maintaining their condition without eliminating livestock use during the growing season.

The reconstruction of stock ponds has increased their storage capacity and improved livestock distribution and management on the allotment. This has led to reduced use of the riparian areas and subsequent improvement.

First Point Allotment. The action taken on the First Point allotment included fencing First Point Spring and providing off-site water for grazing livestock. Protecting this riparian area has improved riparian conditions, and the area is making progress toward meeting Standard 2.

Ford Well Allotment. Actions taken on the Ford Well allotment are similar to those that occurred on the First Point allotment. Old Corral Spring and Ford Well Spring have both been fenced, and off-site water has been provided for livestock. Riparian conditions have improved, thereby making progress toward meeting Standard 2.

Forty Mile Ridge Allotment. The BLM has completed maintenance of spring exclosure fences. Wilcox spring was modified to maintain riparian vegetation at the spring source. Excluding livestock has improved the vegetation surrounding the springs and has made progress toward meeting Standard 2.

Voluntary nonuse has decreased riparian utilization levels, helping these areas to improve and make progress toward meeting Standard 2. The use of supplement, which draws livestock into less used areas of the allotment and away from riparian areas, has improved livestock distribution. This has further lessened the use of riparian areas and addressed the recommendation to develop and relocate water sources to improve livestock distribution. Standard 4 was not met due to natural background geologic and physiographic conditions unrelated to livestock grazing.

Headwaters Allotment. Although the 2006 Rangeland Health Determination was that the Headwaters allotment did not meet or achieve Standards 2 and 4, past grazing practices were the primary causal factor. Under the current season of use, November 1 to March 15, progress continues to be made toward meeting Standard 2, as indicated by monitoring and PFC assessments. Additionally the BLM has reduced use in riparian areas in the Wahweap drainage. Also, the BLM has coordinated with permittees annually to properly stock the allotment, based on available forage. These actions are expected to improve water quality, making progress toward meeting Standard 4. The 2006 determinations also attributed geological and physiographic conditions as a contributing factor for not meeting Standard 4; this may not be an issue the BLM can resolve through management.

Hells Bellows Allotment. Voluntary nonuse has been the primary action taken by the permittee in coordination with the BLM to improve riparian conditions on this allotment.

Lake Allotment. The modifications identified in the 2006 Rangeland Health Determination have been taken on this allotment; as anticipated, it has improved conditions. Complete nonuse from 2001 to 2006 and partial voluntary nonuse from 2007 to 2013 has resulted in the rest or very light use of Fiftymile Mountain (physical location of the Lake allotment and summer pastures of the Rock Creek-Mudholes allotment). The BLM removed unauthorized feral cattle, resulting in less impact on riparian areas and providing for rest and recovery from livestock impacts. Maintaining spring protection fences and pasture fences has improved riparian conditions.

Last Chance Allotment. The removal of feral cattle and voluntary nonuse take into account the failed seedings and reduced pressure on the riparian areas. The reduced use has led to improved conditions of riparian areas, as anticipated. Maintaining the Relishen Spring protection fence has also improved riparian conditions. Because of these actions, such riparian areas as the Last Chance Creek have exhibited increased vegetation recruitment, vigor, and continuity. This has made progress toward meeting Standard 2. Improved riparian conditions provide for water quality in line with the geologic and physiographic conditions on the allotment; livestock are no longer considered a causal factor in not meeting Standard 4.

Lower Cattle Allotment. The grazing management modifications identified forage availability and the proper distribution and management of livestock (water distribution, development of an allotment management plan, and fencing) as concerns on the allotment. Voluntary nonuse addresses forage availability by adjusting annually the numbers of livestock using the allotment. The water-controlled, deferred rotation of livestock, maintenance of stock ponds, and use of supplements together improve livestock management. This comes about by reducing livestock concentrations, improving recovery periods for key forage species, and shortening grazing periods. As a result, PFC assessments in 2010 indicate the riparian areas are now in PFC, and upland monitoring shows gains in species diversity.

Mollies Nipple Allotment. The actions taken by the BLM and the permittee have improved conditions for riparian areas, soils, and vegetation in the allotment. The permittee's voluntary nonuse has addressed the loss of available forage, and actual use levels have not exceeded the authorized use. Use levels have been adjusted annually for drought conditions. The BLM has treated and restored the vegetation on more than 8,500 acres. The permittee is once again following the deferred rest rotation grazing system, providing for rest and recovery from grazing impacts and improved vegetative conditions. The BLM and permittee have maintained or constructed pipelines, spring developments, protection fences, and water catchments (stock ponds), thereby improving livestock distribution and lessening impacts. Riparian health has also improved as a result of these actions, with increased recovery periods and less overall use. PFC assessments and allotment monitoring have shown significant improvement on the allotment.

Nipple Bench Allotment. The primary reason for not achieving Standard 2 in the 2006 Rangeland Health Determination was that a county road was affecting Nipple Spring; livestock was not a causal factor. The location of the spring and road in a narrow canyon bottom does not allow for practical options for relocating the road. Not meeting Standard 4 was due primarily to natural

background geologic and physiographic conditions, though livestock grazing may be a minor contributing factor.

Rock Creek-Mudholes Allotment. The modifications identified in the 2006 Rangeland Health Determination have been taken on this allotment, and as anticipated improved conditions have resulted. Complete nonuse from 2001 to 2006 and partial voluntary nonuse from 2007 to 2013 have resulted in the rest or very light use of Fiftymile Mountain, as recommended. The BLM has removed unauthorized feral cattle, resulting in less impact on riparian areas and providing for rest and recovery from livestock impacts. Maintaining spring protection fences and pasture fences has improved riparian conditions, thereby minimizing the impact of livestock grazing on Standard 4. This also has addressed the concern that livestock use is a causal factor in not meeting this standard. Natural (geologic and physiographic) conditions also affect whether this standard is met.

School Section Allotment. The BLM acquired this allotment, consisting of one state school section, about the time rangeland health assessments were being conducted. The GSENM issued a BLM grazing permit shortly after acquisition and began managing the area. Following the 2006 Rangeland Health Determination, the BLM implemented four years of rest (100 percent voluntary nonuse from 2007 to 2010). Actual use before the BLM's acquisition is not known. Nonuse has reduced the impacts on upland vegetation and has increased diversity, vigor, and recruitment of desired species. Assessments completed in 2013 indicate improved conditions and significant progress toward meeting land health standards.

Soda Allotment. Yearlong use of this allotment by feral livestock had a major impact on the riparian areas; this use was not identified in the 2006 Rangeland Health Determination for this allotment. Removing feral livestock and maintaining spring exclosures excluding livestock from spring sources have addressed concerns regarding Standard 2. Maintaining and improving the water developments has improved livestock distribution and use supervision; adhering to the existing rotational grazing system has ensured that spring grazing does not occur after March 31 on consecutive years. These actions and the nonuse from 2001 to 2006, which was implemented immediately when the BLM recognized poor range conditions during assessment, have made significant progress toward meeting both Standards 1 and 2.

Swallow Park Allotment. In coordination with permittees, the BLM adjusted the timing of use of the Bulrush Pasture, which has allowed for spring growth and vegetation recruitment in the riparian corridor. Voluntary nonuse based on available forage and range condition has also reduced such impacts as bank shear, utilization, and trampling. The BLM noted Improvement in assessments it conducted in 2010.

Upper Paria Allotment. Voluntary nonuse has resulted in fewer grazing impacts on upland areas, seedings, and riparian vegetation. Maintaining riparian protection fences, pipelines, and stock ponds has protected riparian areas and increased the distribution of cattle throughout the allotment. As a result, those areas with adequate water and less affected by the scouring of high water events and diversion for agriculture have improved and are making significant progress toward meeting Standard 2. Voluntary nonuse has addressed the loss of forage resulting from seedings that are no longer productive. These seedings have crossed a threshold that, without restoration, will continue to not meet Standard 1, despite the substantial nonuse. Where

seeding restoration has occurred, significant progress toward meeting standards has been made, and the BLM intends to conduct additional restoration treatment as funding becomes available. In the meantime, voluntary nonuse continues at levels consistent with forage production. Standard 4 was not being met, due primarily to natural background geologic and physiographic conditions and the influence of irrigation diversion dewatering outside the BLM's control.

Vermilion Allotment. The permittee has implemented voluntary nonuse and the rehabilitation of approximately 3,100 acres of seeding and vegetation restoration work. The intent was to address the upland issues and make significant progress toward meeting Standards 1 and 3. Soil stability, vegetation recruitment, diversity, and desired species have increased. Installing and repairing spring protection fences and constructing water developments has aided livestock distribution throughout the allotment and decreased impacts on riparian areas. Voluntary nonuse has also decreased the impacts from livestock grazing on the riparian areas. These actions have resulted in significant progress toward meeting Standard 2. The improved riparian conditions minimize the impact of livestock grazing on water quality (Standard 4) by filtering sediment, maintaining vegetation that stabilizes the riparian area, and shading the site, thereby reducing evaporation and maintaining water temperatures. Establishing exclosure fences eliminates trampling, compaction, and other impacts on water quality.

Forecast

The BLM forecasts that the demand for livestock forage and livestock permits will continue and will likely increase. Kane and Garfield Counties have indicated they would like to see improved land health and increased grazing levels. Local ranchers have stressed the importance of the GSENM to their ranching operations and the importance of ranching to their families.

Data Gaps

The BLM will calculate total forage production based on ecological site descriptions for the GSENM. The BLM is implementing the AIM strategy. AIM provides a framework for integrated, cross-program assessment, inventory, and monitoring of resources at multiple scales of management. In 2013, AIM surveys began as a pilot program on 2 of the 79 grazing allotments (Death Hollow and Last Chance). During July and August 2013, the BLM sampled 35 plots for assessment, including 21 plots in Death Hollow and 14 plots in Last Chance allotments. In 2014, the AIM sampling strategy was changed from an allotment-focused sampling to a sampling design that included the entire planning area. The change was intended to collect data to better inform the EIS, both in terms of refining forage production calculations and to supplement land health condition data. In 2014, data were collected from 50 plots, representing the full range of ecological site types in the planning area (Great Basin Institute 2014). As more data becomes available, the BLM will be able to better estimate total forage production on GSENM. See Section 2.2, Vegetation (Data Gaps) for more information.

2.2 VEGETATION

Upland Vegetation

Upland vegetation includes those species not associated with rivers, creeks, lakes, springs, wetlands, or other surface or shallow sub-surface water. Upland vegetation comprises the vast majority of vegetation within the planning area. Upland vegetation provides an enormous variety

of functions in an ecosystem, and also provides for a variety of human and animal uses. Upland vegetation stabilizes soils, prevents erosion, uses carbon dioxide, releases oxygen, increases species diversity, and provides habitat and food for animals and resources for human use.

Ecosystems reflect complex sets of interactions between plants, animals, soil, water, air, temperature, topography, fire, and humans. Influences exerted on one component affect other components in the system. Upland vegetation provides many functions within ecosystems. Many of the BLM's land management policies are directed toward managing for healthy upland vegetative communities that support resistant and resilient ecological systems.

Riparian and Wetland Vegetation

Riparian vegetation generally occurs next to rivers, creeks, lakes, springs, and wetlands. Riparian areas are a transition zone between upland and aquatic ecosystems. Riparian areas occur where water is perennial, intermittent, or ephemeral. Riparian areas are defined as:

> [A] form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittent flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels are typical riparian areas (Leonard et al. 1992, p. 7).

Wetlands occur in spaces between terrestrial and aquatic systems where the water table is usually at or near the surface or where shallow water covers the land (Cowardin et al. 1979). Soil, water conditions, and vegetation type distinguish wetlands from all other ecosystems. The US Army Corps of Engineers regulates wetlands, which are defined as "those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (US Army Corps of Engineers 1987, p. 9)."

Wetlands must have one or more of the following three attributes:

1. At least periodically, the land supports predominantly hydrophytes (plants that grow only in water or very moist soil).
2. The substrate is predominantly undrained hydric soil (soil formed under conditions of saturation, flooding, or ponding).
3. The substrate is not solid, is saturated with water, or is covered by shallow water at some time during the growing season of each year.

Both riparian areas and wetlands are composed of aquatic vegetation with unique soil characteristics that developed under the influence of perennial water. The increased moisture found in these areas produces unique plant communities that differ noticeably from the surrounding upland vegetation.

Noxious Weeds and Nonnative Invasive Plants
In general, weeds disrupt or have the potential to disrupt or alter the natural ecosystem function, composition, or diversity of the site they occupy. These species can complicate the use of local natural resources and may interfere with management objectives for the site.

Invasive plants are either not native to the area where they are growing or, if native, are a minor component of the original plant community or communities. These species have the potential to become a dominant or co-dominant species on the site if their future establishment and growth is not controlled by management interventions. Invasive plants also include noxious weeds. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants (BLM Handbook H-1740-2, Integrated Vegetation Management). Invasive plants are widespread and can damage crops, affect entire industries, and harm the environment and public health. Organisms that have been moved from their native habitat to a new location, especially from a different country, are typically referred to as nonnative.

Noxious weeds are plant species designated by a federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common in the US (BLM Handbook H-1740-2, Integrated Vegetation Management). Noxious weeds in the planning area are native or nonnative plants as designated by the Utah Noxious Weed Act of 2008. Although noxious weeds are usually nonnative, this document makes a distinction because native plants can be considered invasive.

Regional Context
The analysis area is within portions of two US Environmental Protection Agency (EPA) level III ecoregions: Colorado Plateau and Arizona/New Mexico Plateau (EPA 2011). The Colorado Plateau ecoregion is located primarily in eastern Utah and western Colorado, with some overlap into northern Arizona and New Mexico. More than 99 percent of the planning area (2,313,700 acres and more than 99 percent of the decision area (2,251,900 acres are within the Colorado Plateau ecoregion. Pinyon-juniper and Gambel oak woodlands as well as saltbrush-greasewood shrublands characterize the ecoregion. Summer moisture from thunderstorms supports warm season grasses. Many endemic plants occur (EPA 2013, p. 5).

The analysis area is also within the ecoregion addressed in the Colorado Plateau Rapid Ecoregional Assessment Report (REA; Bryce et al. 2012). The REA represents a landscape approach to land and resource management in the ecoregion. The REA integrates available scientific data and information from BLM field offices, other federal and state agencies, and public stakeholders to develop shared responses and collaborative management efforts across administrative boundaries. The REA also assess the status of selected ecological resources (conservation elements) at the ecoregional scale and investigates how this status may change in the future. Resources of concern identified in the REA include soil stability, wind erodibility and dust on snow, biological soil crusts, and aquatic resources (Bryce et al. 2012). Vegetation and weeds are discussed as relevant to the resources described above.

The Arizona/New Mexico Plateau ecoregion occurs in northern Arizona, northwestern New Mexico, and reaches into south-central Colorado. It overlaps with the very southern portion of

the planning area and covers 2,500 acres (less than one percent) of the planning area and 1,700 acres (less than one percent) of the decision area. It is a large transitional region between other ecoregions containing semiarid grasslands to the east, shrublands and woodlands to the north and Mojave and Chihuahuan deserts to the west and south (EPA 2013, p. 5).

Indicators

Upland Vegetation

BLM Utah Rangeland Health Standards provide qualitative indicators to help in determining if Standards are being met within the planning area and are appropriate to use at the planning level scale. Standard 3 is the most applicable to upland vegetation and states that desired species, including native, threatened, endangered, and special status species, are maintained at a level appropriate for the site and species involved. Other indicators may be appropriate depending on the scale of the analysis (e.g., project, planning, and landscape levels). As described in Section 2.1, the BLM completed a GSENM-wide evaluation of rangeland health in 2006. Since that time, it conducted additional upland assessments in 2013 and 2014.

Interpreting Indicators of Rangeland Health (Pellant et al. 2005) provides an assessment protocol for qualitative, preliminary evaluation of soil/site stability, hydrologic function, and biotic integrity at the ecological site level. The technical approach provides early warnings of potential problems and opportunities and helps communicate ecological concepts to a wide variety of audiences (Pellant et al. 2005, p. 1). *Interpreting Indicators of Rangeland Health* requires the use of the ecological site concept, which is a classification system that divides landscapes based on the potential of the land to produce distinctive kinds, amounts, and proportions of vegetation. This potential is determined by soils, climate, and topography (Pellant et al. 2005, p. 9). Personnel conducting the assessment evaluate the functional status of 17 qualitative indicators (Pellant et al. 2005, p. 12).

Riparian and Wetland Vegetation

The BLM uses PFC as the indicator for riparian and wetland vegetation. It also uses PFC as a qualitative method for assessing the condition of riparian areas and wetlands. PFC refers to both the assessment process and the on-the-ground condition of riparian areas and wetlands. The assessment process consists of an approach that considers the hydrology, vegetation, and erosion/deposition attributes of the area; the on-the-ground condition refers to how well the physical processes are functioning. This condition is a state of resiliency that allows a riparian area or wetland to hold together during high-flow events with a high degree of reliability. This resiliency allows an area to then produce desired values over time, including fish habitat, neotropical bird habitat, and forage. Riparian areas and wetlands that are not functioning properly cannot sustain these values.

A riparian area or wetland is considered to be in PFC when adequate vegetation and landforms are present to accomplish the following:

1. Dissipate stream energy associated with high water flow, thereby reducing erosion and improving water quality
2. Filter sediment, capture bedload, and aid floodplain development

3. Improve floodwater retention and groundwater recharge
4. Develop root masses that stabilize streambanks against cutting action
5. Support greater biodiversity

If a riparian area or wetland is not in PFC, it is placed into one of the following three categories:

1. Functional-At Risk—Riparian areas and wetlands are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.
2. Nonfunctional—Riparian areas and wetlands are not providing adequate vegetation or landforms to dissipate stream energy associated with high flows and thus are not maintaining or improving the condition of the area.
3. Unknown—Sufficient information on which to make any determination for riparian areas and wetlands is lacking.

The NPS has a lentic assessment process that differs from the BLM's PFC approach. The NPS assesses springs by characterizing the site (e.g., noting wetted area size, geomorphology, and vegetation) and rating the site. The rating is based on biological significance, such as habitat complexity and discharge rates, as well as on threats, such as the presence of exotic plant species and disturbance caused by human development or ungulates. The four potential scores are as follows:

1. Intact, functioning spring, some natural background disturbances occurring
2. Functioning, but potentially at-risk, altered disturbance regimes
3. Degraded, loss of much of function and stability, disturbances leading to erosion and spring loss
4. More or less nonfunctional, severely degraded, to destroyed, without most function, stability, and biotic elements

Utah Rangeland Health Standard 2 states that riparian and wetland areas are in properly functioning condition, stream channel morphology and functions are appropriate to soil type, climate, and landform. Indicators specific to Standard 2 are described in Section 2.1. As described in Section 2.1, the BLM completed a GSENM-wide evaluation of rangeland health in 2006. It conducted additional riparian assessments and monitoring in 2007, 2010, 2012, 2014, and 2015.

Noxious Weeds and Nonnative, Invasive Plants

Indicators of weeds include the presence of a noxious weed or nonnative, invasive plant population, the size of the population, acres of treatment completed to control these populations, and success of the control treatment.

Current Condition

Upland Vegetation

The Colorado Plateau REA (Bryce et al. 2012) includes a discussion of the current condition of upland vegetation within the ecoregion. The REA designates eight upland vegetation types (as defined in the SWReGAP) as REA conservation elements. The upland vegetation types selected represent the regional range in elevation and aridity within the ecoregion.

Seven of the vegetation types are represented in the decision area; acres in the decision area are presented in parentheses in the following: Colorado Plateau Pinyon-Juniper Woodland (comprises 577,600 acres in the decision area), Inter-Mountain Basins Big Sagebrush Shrubland (384,400 acres), Inter-Mountain Basins Montane Sagebrush Steppe (10,900 acres), Rocky Mountain Gambel Oak-Mixed Montane Shrubland (40,700 acres), Colorado Plateau Pinyon-Juniper Shrubland (10,900 acres), Colorado Plateau Blackbrush-Mormon-Tea Shrubland (245,400 acres), and Inter-Mountain Basins Mixed Salt Desert Scrub (139,800 acres; Bryce et al. 2012, p. 12; REA GIS 2012). Table 2-5, Vegetation Types, compares vegetation types described in the REA to the National Vegetation Classification System (NVCS) macrogroups described below. Acres reported above vary from those in Table 2-5 because of the different data sources for the REA vegetative communities and the NVCS macrogroups.

Table 2-5
Vegetation Types

REA Conservation Elements	SWReGAP Cover Type	NVCS Macrogroup	NVCS Code	Acres in Planning Area (%)	Acres in Decision Area (%)[1]
Colorado Plateau Pinyon-Juniper Shrubland; Colorado Plateau Pinyon-Juniper Woodland	Colorado Plateau Pinyon-Juniper Shrubland; Colorado Plateau Pinyon-Juniper Woodland	Rocky Mountain Two-Needle Pinyon-Juniper Woodland	M027	970,000 (42%)	946,100 (42%)
Not a REA Conservation Element	Colorado Plateau Mixed Bedrock Canyon and Tableland; Inter-Mountain Basins Active and Stabilized Dune; Inter-Mountain Basins Shale Badland; Inter-Mountain Basins Volcanic Rock and Cinder Land	Intermountain Basin Cliff, Scree, and Rock Vegetation	M118	613,400 (26%)	607,100 (27%)
Colorado Plateau Blackbrush-Mormon-Tea Shrubland	Colorado Plateau Blackbrush-Mormon-Tea Shrubland; Inter-Mountain Basins Semi-Desert Grassland; Inter-Mountain Basins	Great Basin and Intermountain Dry Shrubland and Grassland	M171	362,700 (16%)	355,000 (16%)

Table 2-5
Vegetation Types

REA Conservation Elements	SWReGAP Cover Type	NVCS Macrogroup	NVCS Code	Acres in Planning Area (%)	Acres in Decision Area (%)[1]
	Semi-Desert Shrub Steppe; Southern Colorado Plateau Sand Shrubland;				
Inter-Mountain Basins Big Sagebrush Shrubland; Inter-Mountain Basins Montane Sagebrush Steppe	Inter-Mountain Basins Big Sagebrush Shrubland; Inter-Mountain Basins Montane Sagebrush Steppe	Great Basin and Intermountain Tall Sagebrush Shrubland and Steppe	M169	191,900 (8%)	182,400 (8%)
Inter-Mountain Basins Mixed Salt Desert Scrub	Inter-Mountain Basins Mat Saltbush Shrubland; Inter-Mountain Basins Mixed Salt Desert Scrub	Great Basin Saltbrush Scrub	M093	98,300 (4%)	96,200 (4%)
Not a REA Conservation Element	Inter-Mountain Basins Greasewood Flat	Cool Semi-Desert Alkali-Saline Wetland	M082	21,800 (1%)	21,400 (1%)
Not a REA Conservation Element	Rocky Mountain Ponderosa Pine Woodland; Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland;	Northern Rocky Mountain Lower Montane and Foothill Forest	M017	16,400 (1%)	14,700 (1%)
Not a REA Conservation Element	Rocky Mountain Lower Montane Riparian Woodland and Shrubland	Rocky Mountain and Great Basin Flooded and Swamp Forest	M034	8,700 (<1%)	7,100 (<1%)
Not a REA Conservation Element	Invasive Annual Grassland; Invasive Southwest Riparian Woodland and Shrubland; Invasive Annual and Biennial Forbland	Introduced and Semi Natural Vegetation	M332	8,500 (<1%)	8,100 (<1%)
Not a REA Conservation Element	Developed	Recently Disturbed or Modified	M333	7,400 (<1%)	7,000 (<1%)
Not a REA Conservation Element	Rocky Mountain Cliff and Canyon	Rocky Mountain Cliff, Scree and Rock Vegetation	M113	6,300 (<1%)	6,200 (<1%)

Table 2-5
Vegetation Types

REA Conservation Elements	SWReGAP Cover Type	NVCS Macrogroup	NVCS Code	Acres in Planning Area (%)	Acres in Decision Area (%)[1]
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	Rocky Mountain Gambel Oak-Mixed Montane Shrubland	Southern Rocky Mountain Montane Grassland and Shrubland	M049	5,900 (<1%)	3,500 (<1%)

Sources: SWReGAP GIS 2004; NVCS GIS 2014
[1]Acres reported above vary from those previously described for the REA vegetative communities because of the different data sources for the REA vegetative communities and the NVCS macrogroups.

Within the last 50 years in the ecoregion, the large blocks of intact vegetation that characterized the Colorado Plateau have been fragmented or otherwise impacted by nonnative plants, minerals development including oil and gas leasing and uranium mining, recreation, livestock grazing, and rural home development, road building, and expanding off-road vehicle usage (Bryce et al. 2012, p. 45).

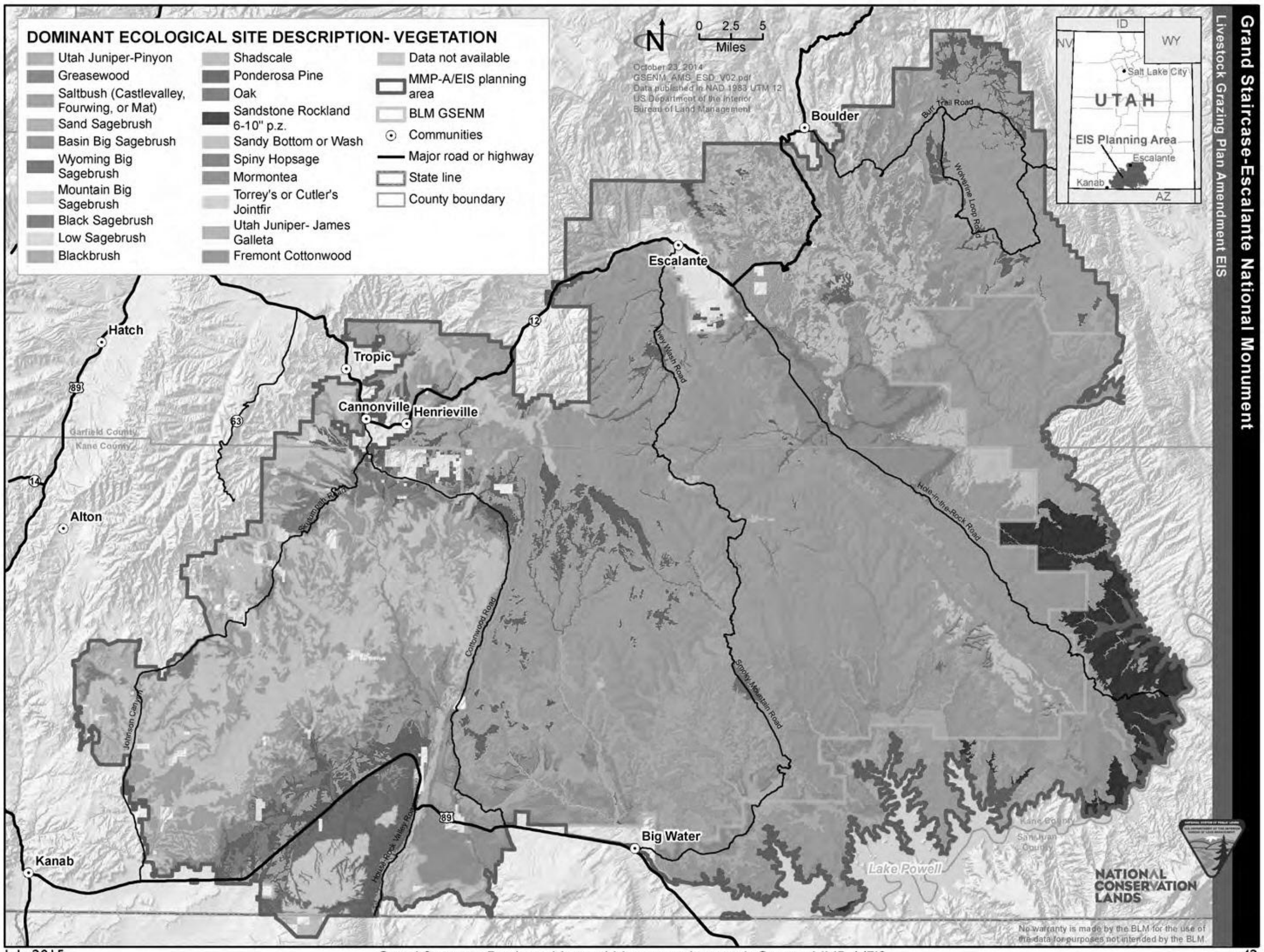
The planning area supports a diversity of existing and potential upland vegetation types. Vegetation types are controlled in large part by site-specific topography, soil type, and climatic conditions. Existing vegetation types in the planning area are described using the NVCS. It identifies 12 major existing vegetation types (macrogroups) in the planning area (Table 2-5). The NVCS macrogroups were identified by using BLM IM 2013-111 to crosswalk from the SWReGAP data (Table 2-5); the macrogroups represent the vegetation types that are present in the planning area.

The NVCS macrogroups do not distinguish between upland and riparian vegetation types. Ten of the vegetation types listed in Table 2-5 are upland vegetation types. Cool Semi-Desert Alkali-Saline Wetland (M082) and Rocky Mountain and Great Basin Flooded and Swamp Forest (M034) are riparian and/or wetland vegetation types and are included in the table for completeness. Riparian and wetland vegetation is discussed in the following section.

While NVCS macrogroups describe the vegetation types that are currently on the ground, ecological site descriptions may be used to describe the potential of a given area to support a certain vegetation community, regardless of what is presently on the site. Ecological site descriptions are a useful tool for evaluating the land's suitability for various land uses, capability to respond to different management activities or disturbance processes, and ability to sustain productivity over the long term (US Department of Agriculture, Natural Resources Conservation Service [NRCS] 2014).

An ecological site is a "… distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation" (NRCS 2003, Glossary-17). There are 62 recognized ecological sites within the planning area, though many of these sites contain similar vegetation types. Figure 2-2, Dominant Ecological Site Description – Vegetation Type, shows the ecological sites within the planning area. For display

Figure 2-2



DOMINANT ECOLOGICAL SITE DESCRIPTION- VEGETATION
Utah Juniper-Pinyon
Greasewood
Saltbush (Castlevalley, Fourwing, or Mat)
Sand Sagebrush
Basin Big Sagebrush
Wyoming Big Sagebrush
Mountain Big Sagebrush
Black Sagebrush
Low Sagebrush
Blackbrush
Shadscale
Ponderosa Pine
Oak
Sandstone Rockland 6-10" p.z.
Sandy Bottom or Wash
Spiny Hopsage
Mormontea
Torrey's or Cutler's Jointfir
Utah Juniper- James Galleta
Fremont Cottonwood
Data not available
MMP-A/EIS planning area
BLM GSENM
Communities
Major road or highway
State line
County boundary
0 2.5 5
Miles
Grand Staircase-Escalante National Monument
Livestock Grazing Plan Amendment EIS
UTAH
Salt Lake City
EIS Planning Area
Escalante
Kanab
ID
WY
NV
AZ
Boulder
Escalante
Hatch
Tropic
Cannonville
Henrieville
Alton
Kanab
Big Water
Lake Powell
Garfield County
Kane County
Hole-in-the-Rock Road
Cottonwood Road
Smoky Mountain Road
Burr Trail Road
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purposes, the figure groups the ecological sites by dominant vegetation type. Ecological site descriptions provide information on:

1. Site characteristics, including physiographic, climate, soil, and water features
2. Plant communities, including plant species, vegetation states, and ecological dynamics
3. Site interpretations, including management alternatives for the site and its related resources
4. Supporting information, such as relevant literature, information, and data sources (NRCS 2014)

The same ecological site will be found on the landscape wherever the same prevailing climate, topographic, and soil characteristics occur (Busby and Green 2006, p. 205). Information provided by ecological site descriptions can be used to interpret how a given site may respond to management actions when compared with other sites in the area. Ecological site descriptions also help to inform management over large areas that include many sites with different soils, topography, climate, and expected plant community composition, production, and disturbance regimes (Busby and Green 2006, p. 219).

Over a three-year period, *Interpreting Indicators of Rangeland Health* was used to evaluate the status of three ecosystem attributes (soil/site stability, hydrologic function, and biotic integrity) at over 500 locations in and adjacent to the planning area. The assessment results indicate that big sagebrush ecological sites with relatively high production potential had high frequencies of assessments with low ratings for all three ecosystem attributes; in contrast, shallow-soil ecological sites with relatively low production potential and the presence of Utah juniper and Colorado pinyon had low frequencies of assessments and low ratings for all three attributes (Miller 2008, p. 260).

The following factors were attributed to the low ratings:

1. Potential primary production and long-term exposure to production-dependent land-use activities such as livestock grazing
2. The presence of unpalatable woody plants that have the capacity to increase and become persistent site dominants due to selective herbivory, absence of fire, or succession
3. Soil texture through effects on hydrologic responses to grazing, trampling, and other disturbances
4. Past management that resulted in high livestock use of ecological sites with sensitive fine-loamy soils following treatments designed to increase forage availability (Miller 2008, p. 260)

Riparian and Wetland Vegetation

Within the ecoregion, many riparian ecosystems have been lost or degraded since Euro-American contact. Causes of this decline include direct conversion to other uses; changes in the natural flow regimes and suppression of fluvial processes; livestock grazing; and invasive species

invasion (Bryce et al. 2012). The mechanism by which this degradation occurs varies, depending on the threat. For example, livestock grazing has the potential to alter streamside morphology, increases sedimentation, degrades riparian vegetation through trampling and consumption and causes nutrient loading to the system. In contrast, invasive plant species, such as tamarisk (*Tamarix* spp.) or Russian olive (*Elaeagnus angustifolia*), change riparian areas by successfully outcompeting native riparian species. Species such as tamarisk produce seeds multiple times in a year and are more tolerant of drought and flow alterations than native species (Bryce et al. 2012). Russian olive is considered to be of greater concern in the planning area than tamarisk due to its tendency to alter stream hydrology and nutrient cycling and to substantially lower habitat quality for migratory bird species (Zouhar 2005).

In addition, while the BLM considers tamarisk a significant change agent in the ecoregion, the species has been declining. This is due to the tamarisk leaf beetle (*Diorhabda carinulata*), which the US Department of Agriculture, Agricultural Research Service in Lovelock, Nevada, released in 2001 as a biocontrol agent for tamarisk. The beetle's range quickly expanded, and there are a number of sites in Utah where it has been released since 2004. Since then, the beetle has spread and has destroyed tamarisk in the planning area. Studies have shown that defoliation can destroy tamarisk in three to five years (Clements et al. 2012).

The BLM has conducted PFC assessments on 192 lotic sites and 142 lentic sites in the planning area. This was part of the GSENM-wide rangeland health evaluations between 2000 and 2013 (Table 2-6, PFC Assessment Results for Lentic Sites, and Table 2-7, PFC Assessment Results for Lotic Sites). When the BLM issued the 2006 Rangeland Health Determinations, sites were determined to meet Standard 2 if they were rated functioning at risk with upward trend or PFC. Sites with other ratings were not considered to meet Standard 2. Since the 2006 rangeland health determinations, additional assessments have been conducted and assessment results have been updated.

As shown in Table 2-6, 68 lentic sites (48 percent of all sites assessed) were in PFC as of the latest assessment. In addition, 23 sites (16 percent) were functioning at risk with an upward trend, while 44 sites (31 percent) were functioning at risk with either no apparent trend or a downward trend, and 7 sites (5 percent) were nonfunctional. As presented in Table 2-7, 93 lotic sites (49 percent of all sites assessed) were in PFC as of the latest assessment. In addition, 32 sites (17 percent) were functioning at risk with an upward trend, while 47 sites (24 percent) were functioning at risk with either no apparent trend or a downward trend, and 20 sites (10 percent) were nonfunctional.

Springs and seeps also occur in the planning area. Springs occur where water flows from an underground aquifer to the surface and usually emerge from a single point. Seeps are similar to springs, though they generally have a lower flow rate than springs and emerge over a larger area, having no well-defined origin. Due to their higher volume, springs have the potential to form a stream and create riparian habitat (US Fish and Wildlife Service, undated). Springs are important components of the desert ecosystem for a number of reasons. Historically, springs were the only reliable source of water for humans and animals, other than perennial streams, which are limited in the planning area. Springs are biodiversity hotspots that support a large proportion of the aquatic and riparian species in arid regions (Sada and Pohlman 2002).

Table 2-6
PFC Assessment Results for Lentic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend
LE0001	Sand Spring	2000	FAR	DOWNWARD
		2013	PFC	
LE0002	Cole Spring	2000	NF	
		2013	PFC	
LE0003	Nephi Spring	2000	NF	
		2013	FAR	UPWARD
LE0004	Brown Spring	2000	FAR	NOT APPARENT
		2013	PFC	
LE0005	Unnamed Spring (on private)	2000		
LE0006	Fin Little Spring	2000	NF	
		2007	FAR	UPWARD
LE0007	Jenny Clay Hole Spring	2000	FAR	DOWNWARD
		2010	NF	
		2013	FAR	UPWARD
LE0008	Wildcat Spring	2001	FAR	DOWNWARD
		2013	PFC	
LE0009	Box Elder Canyon Spring	2001	NF	
		2010	FAR	UPWARD
		2014	FAR	UPWARD
LE0010	Kitchen Corral Spring	2001	FAR	DOWNWARD
		2007	PFC	
LE0011	Unnamed Spr. N of Kitchen Corral Spring	2001	NF	
		2007	FAR	NOT APPARENT
LE0012	Rockhouse Spring	2001	FAR	DOWNWARD
		2007	PFC	
LE0013	NE Spring	2001	NF	
		2010	FAR	NOT APPARENT
LE0014	Whitehouse Spring	2001	PFC	
LE0015	Calf Spring	2001	FAR	UPWARD
LE0017	Lake Cove Spring	2001	NF	
		2007	NF	
LE0018	Round Valley Seep	2001	NF	
		2007	PFC	
LE0019	Fourmile Water	2001	PFC	
LE0020	No Name Spring	2001	NF	
LE0021	Wiregrass Spring	2001	FAR	DOWNWARD
LE0023	John Henry Spring	2002	PFC	
LE0024	Clints Canyon Spring	2002	PFC	
LE0025	Gunsight Spring	2002	PFC	
LE0026	Water Canyon Spring	2002	FAR	NOT APPARENT

Table 2-6
PFC Assessment Results for Lentic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend
LE0027	Warm Creek Spring	2002	PFC	
LE0028	Joe Perdence Spring	2002	FAR	NOT APPARENT
		2010	PFC	NOT APPARENT
LE0029	Harris Wash Corral Spring	2002	PFC	
LE0030	Upper Cattle	2002	PFC	
LE0031	Circle Spring	2002	FAR	NOT APPARENT
LE0032	Wild Rose Spring	2002	FAR	UPWARD
LE0033	Horse Spring	2002	PFC	
LE0034	Lower Trail Spring	2002	PFC	
LE0040	Slickrock Water	2002	PFC	
LE0041	25 Mile Corral Spring	2002	PFC	
LE0042	Kent Spring	2002	FAR	NOT APPARENT
		2010	PFC	
LE0043	Lake	2002	PFC	
LE0044	Cougar Spring	2002	PFC	
LE0045	Quakie Spring	2002	PFC	
LE0046	Georgie Hollow Spring	2002	FAR	UPWARD
LE0047	Llewlyn Spring	2002	FAR	NOT APPARENT
		2004	FAR	DOWNWARD
		2007	FAR	UPWARD
LE0048	Mudholes Spring	2002	FAR	DOWNWARD
		2004	FAR	DOWNWARD
		2007	FAR	UPWARD
LE0049	Pocket Hollow Spring	2002	NF	
		2002	FAR	DOWNWARD
		2004	FAR	DOWNWARD
LE0050	Lower Coyote Spring	2001	NF	
		2007	PFC	
LE0051	Cane Bench Well	2002	PFC	
LE0052	Cliff Spring	2002	FAR	NOT APPARENT
LE0053	Emigrant Spring	2002	PFC	
LE0059	Center Knoll Spring	2003	PFC	
LE0500	Pump Canyon	2014	FAR	UPWARD
LE0501	Gratuitous Spring	2001	FAR	DOWNWARD
		2007	FAR	NOT APPARENT
		2014	PFC	
LE0502	Pump House Spring	2001	PFC	
LE0503	Unnamed Spring	2001	PFC	
LE0504	Unnamed Spring	2001	FAR	NOT APPARENT
LE0505	Rock Springs	2001	FAR	DOWNWARD

Table 2-6
PFC Assessment Results for Lentic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend
LE0510	Tibbet Spring	2001	FAR	DOWNWARD
		2007	FAR	UPWARD
LE0511	Unnamed Spring	2001	FAR	DOWNWARD
		2007	FAR	UPWARD
LE0512	Unnamed Spring	2001	FAR	NOT APPARENT
LE0514	Unnamed Spring	2001	FAR	DOWNWARD
LE0515	Brinkerhoff Spring	2002	FAR	DOWNWARD
LE0516	Unnamed	2002	NF	DOWNWARD
LE0518	Unnamed	2002	FAR	DOWNWARD
LE0519	Unnamed	2002	FAR	DOWNWARD
LE0521	Calf Creek Headspring	2002	PFC	
LE0522	Unnamed	2002	FAR	DOWNWARD
LE0523	Calf Creek	2002	PFC	
LE0524	Lower Calf Creek	2002	PFC	
LE0525	Artesian Well	2002	PFC	
LE0527	Henrieville Spring	2002	PFC	
LE0529	Fortymile Spring	2002	FAR	DOWNWARD
		2007	FAR	NOT APPARENT
		2010	FAR	NOT APPARENT
		2014	FAR	UPWARD
LE0530	Willow Gulch Spring	2002	FAR	DOWNWARD
		2007	PFC	
LE0531	Unnamed Spring in Sooner Gulch	2002	NF	
		2007	FAR	DOWNWARD
		2010	PFC	NOT APPARENT
LE0532	Soda Spring	2002	FAR	DOWNWARD
		2007	NF	
		2010	FAR	DOWNWARD
		2014	FAR	DOWNWARD
LE0533	East 50-mile Spring	2002	NF	NOT APPARENT
		2007	NF	
		2010	FAR	UPWARD
		2014	FAR	UPWARD
LE0536	Upper Hurricane # 1	2002	FAR	NOT APPARENT
		2007	PFC	
LE0537	Upper Hurricane II	2002	FAR	DOWNWARD
		2010	PFC	
		2014	PFC	
		2007	FAR	NOT APPARENT

Table 2-6
PFC Assessment Results for Lentic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend
LE0538	Upper Hurricane III	2002	NF	
		2010	PFC	UPWARD
LE0540	Wilcox Spring	2002	NF	
		2007	FAR	NOT APPARENT
LE0545	Little Red Rock Spring	2002	FAR	DOWNWARD
		2002	FAR	DOWNWARD
		2010	PFC	NOT APPARENT
		2014	PFC	
LE0546	Little Red Rock Sp. II	2002	FAR	DOWNWARD
		2010	PFC	NOT APPARENT
		2014	PFC	
LE0550	Upper Reese Seep	2002	FAR	DOWNWARD
		2010	PFC	
LE0551	Cat Spring	2002	FAR	DOWNWARD
		2010	PFC	
LE0552	Glasseye Spring	2002	PFC	
LE0553	Neaf Spring	2002	FAR	DOWNWARD
LE0554	Unnamed (Varney-Griffin)	2002	PFC	
LE0556	Natural Tank		PFC	
LE0557	Sandstone Tank 1	2002	PFC	
LE0558	Sandstone Tank 2	2002	PFC	
LE0559	Sandstone Tank 3	2002	PFC	
LE0560	Calf Spring	2003	FAR	NOT APPARENT
LE0567	Below Harry Cowles Spring		FAR	NOT APPARENT
LE0604	West End Spring	2002	FAR	DOWNWARD
LE0605	West End Spring	2002	NF	
LE0900	Harry Cowles Spring	2002	FAR	DOWNWARD
LE0901	Trib. Spencer	2002	FAR	NOT APPARENT
LE0903	Gates Spring	2002	NF	
		2004	NF	
LE0905	Releshen Seep	2002	NF	
LE0905	Releshen Seep	2010	FAR	
LE0906	Pocket Hollow Spring	2002	NF	
		2002	FAR	DOWNWARD
LE1000	Headquarters Spring	2009	FAR	DOWNWARD
LE1001	Headquarters Spring 2	2001	FAR	DOWNWARD
LE1002	Headquarters Spring 1	2001	FAR	DOWNWARD
LE1003	Spring below rockfall on Hackberry	2001	FAR	NOT APPARENT

Table 2-6
PFC Assessment Results for Lentic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend
LE1200	Sheep Creek Above Dam at Skutumpah Road X'ing	2001	FAR	UPWARD
LE1201	Sheep Creek Below Dam	2001	PFC	
LE1202	Sheep Creek Below Dam	2001	FAR	DOWNWARD
LE1203	Glass Eye Canyon	2002	PFC	
LE1204	Salt Spring	2002	NF	
		2007	FAR	UPWARD
LE1205	Old Corral Spring	2002	FAR	DOWNWARD
		2007	FAR	No Apparent Trend
LE1206	First Point Spring	2002	FAR	DOWNWARD
		2007	FAR	UPWARD
LE1207	Adams Spring	2002	PFC	
		2012	PFC	
LE1208	Corral Draw Spring	2002	FAR	NOT APPARENT
		2012	FAR	
LE1210	Unnamed Spring	2002	PFC	
LE1250	Unnamed – West Moody	2003	PFC	
LE1251	Middle Moody Spring	2003	PFC	
LE1253	Beauty Spot	2003	PFC	
LE1254	Cottonwood Spring	2003	PFC	
LE1501	Rock Springs	2002	FAR	UPWARD
LE1502	Mossy Dell Spring	2002	FAR	DOWNWARD
LE1503	Cockscomb Spring	2002	PFC	
LE1504	Wire Spring	2002	FAR	DOWNWARD
		2007	FAR	UPWARD
LE1505	East End Spring	2002	FAR	DOWNWARD
		2007	FAR	UPWARD
LE1506	Unnamed Cliff Spring	2002	FAR	DOWNWARD
		2007	PFC	
LE1507	Maple Spring	2002	NF	
		2007	FAR	NOT APPARENT
LE1508	Trail Hollow Seep	2002	FAR	DOWNWARD
		2007	FAR	NOT APPARENT
LE1509	Bull Ridge Cliff Spring	2002	FAR	DOWNWARD
LE1510	Burn Spring	2002	FAR	DOWNWARD
		2007	FAR	UPWARD
LE1511	Buck Ridge	2002	NF	
LE1512	Oak Springs	2002	PFC	
LE1513	Sooner Water	2002	FAR	NOT APPARENT
		2007	PFC	

Table 2-6
PFC Assessment Results for Lentic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend
LE1514	Upper Cottonwood Spring	2002	FAR	DOWNWARD
		2007	FAR	DOWNWARD
		2014	FAR	UPWARD
LE1515	Pole Well Spring	2002	FAR	DOWNWARD
		2007	FAR	NOT APPARENT
LE1516	Unnamed Seep	2002	PFC	
LE1518	Ford Well Spring	2002	FAR	DOWNWARD
LE1700	Llellyn Spring	2002	PFC	
LE1701	Grand Bench Spring	2002	NF	
LE1702	Cane Seep	2002	PFC	
LE1703	Seep/Hanging Garden	2002	PFC	
LE1704	Cave Spring	2002	PFC	
		2007	FAR	NOT APPARENT
		2014	PFC	
LE1710	Unnamed below Old Corral Spr	2007	FAR	NOT APPARENT
LE1711	Tang Spring	2007	PFC	
LE1712	Unnamed on Buck Ridge	2007	FAR	NOT APPARENT
LE1713	Unnamed Buck Ridge no.2	2007	FAR	UPWARD
LE1714	Lower Cottonwood Spring	2007	PFC	
LE1716	Willow Tank	2007	FAR	NOT APPARENT
LE2000	Buckskin Gulch Spring	2004	FAR	DOWNWARD
		2010	FAR	NOT APPARENT

Source: BLM GIS 2014a
PFC: proper functioning condition
FAR: functioning at risk
NF: non-functional

Table 2-7
PFC Assessment Results for Lotic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend	Miles
LO0001	Harris	2001	FAR	NOT APPARENT	1.333
		2010	FAR	UPWARD	1.333
LO0002	Harris	2001	FAR	NOT APPARENT	5.732
LO0003	Harris	2001	PFC		4.707
LO0004	25 Mile	2001	FAR	NOT APPARENT	0.574
		2010	FAR	UPWARD	0.574
LO0005	25 Mile	2001	NF		3.031

Table 2-7
PFC Assessment Results for Lotic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend	Miles
LO0006	25 Mile	2001	FAR	UPWARD	2.477
		2010	PFC		2.477
LO0007	Cottonwood	2001	FAR	NOT APPARENT	1.244
		2007	FAR	UPWARD	1.244
LO0008	Cottonwood	2001	FAR	DOWNWARD	1.259
		2007	FAR	UPWARD	1.259
LO0009	Cottonwood	2001	PFC		0.769
LO0009A	Upper Box Elder Spring	2014	PFC		0
LO0010	Cottonwood	2001	FAR	NOT APPARENT	1.635
		2014	PFC		1.635
LO0011	Cottonwood	2001	NF		1.299
LO0012	Cottonwood	2001	FAR	DOWNWARD	3.198
		2007	FAR	UPWARD	3.198
LO0013	Aspen Patch	2002	PFC		0.659
LO0014	Cottonwood	2001	FAR	UPWARD	2.91
LO0015	Paria	2001	FAR	DOWNWARD	1.934
LO0016	Paria	2001	FAR	UPWARD	1.518
		2012	PFC		1.518
LO0017	Paria	2001	FAR	UPWARD	2.53
		2012	FAR	UPWARD	2.53
LO0018	Paria	2001	FAR	NOT APPARENT	4.982
LO0019	Paria	2001	FAR	DOWNWARD	2.185
LO0020	Paria	2001	FAR	NOT APPARENT	4.827
LO0021	Paria	2001	FAR	UPWARD	4.374
LO0025	Alvey Wash	2001	FAR	UPWARD	4.832
LO0026	Willow Gulch	2001	FAR	DOWNWARD	0.602
		2010	PFC		0.602
LO0028	25 Mile	2001	FAR	NOT APPARENT	10.68
LO0029	Phipps	2001	PFC		2.72
LO0032	Left Hand Collet	2001	NOT RATED		0
		2010	PFC		0
LO0033	Horse Canyon	2001	FAR	UPWARD	3.681
LO0034	Horse Canyon	2001	FAR	NOT APPARENT	0.873
LO0035	Horse Canyon	2001	FAR	NOT APPARENT	0.898
LO0036	Dry Hollow	2001	PFC		5.747
LO0037	Harris	2001	FAR	UPWARD	2.804
LO0038	Harris	2001	PFC		8.675
LO0039	Paradise R-1 (E. Fork)	2001	NF		1.842
		2014	NF		1.842

Table 2-7
PFC Assessment Results for Lotic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend	Miles
LO0040	Paradise (Mainstem) R2	2001	FAR	DOWNWARD	1.15
LO0041	Paradise (Mainstem) R3	2001	FAR	DOWNWARD	4.087
		2014	PFC		4.087
LO0042	Last Chance (junction of Paradise with Escalante Canyon)	2001	FAR	DOWNWARD	4.592
		2014	NOT RATED		4.592
LO0043	Pine Creek	2002	PFC		2.685
LO0044	Pine Creek	2002	FAR	DOWNWARD	3.741
LO0045	Coyote Gulch	2002	PFC		7.812
LO0046	Coyote Gulch	2002	FAR	UPWARD	5.359
LO0047	Last Chance Reach 5	2002	FAR	DOWNWARD	4.998
		2010	FAR	UPWARD	4.998
		2014	PFC		4.998
LO0048	Last Chance Reach 6	2002	FAR	NOT APPARENT	18.759
		2014	PFC		18.759
LO0050	Boulder Draw	2002	PFC		0.954
LO0051	Spencer Canyon	2002	FAR	DOWNWARD	0.525
LO0052	Spencer Canyon	2002	FAR	UPWARD	0.273
LO0053	Harry Cowles	2002	FAR	DOWNWARD	0.322
LO0054	Indian Gordens	2002	FAR	DOWNWARD	0.64
LO0055	Spencer Canyon	2002	FAR	DOWNWARD	0.728
LO0056	Spencer Canyon	2002	FAR	UPWARD	1.286
LO0057	Pocket Hollow	2002	NF		0.924
LO0058	Gates Draw	2002	NF		0.38
LO0059	Little Valley Creek	2002	NF		1.28
LO0060	Upper Little Valley	2002	NF		0.646
LO0062	Drip Tank	2002	FAR	UPWARD	2.072
		2014	PFC		2.072
LO0063	Wesses	2002	FAR	UPWARD	1.963
LO0064	John Henry	2002	FAR	DOWNWARD	1.682
LO0065	Clints Canyon	2002	FAR	UPWARD	1.251
LO0066	Clay Gorge	2002	FAR	DOWNWARD	0.499
LO0067	Allens Creek	2002	FAR	DOWNWARD	0.868
LO0068	North Creek	2002	PFC		5.784
LO0069	Davis Gulch	2002	PFC		3.156
LO0070	Llewellen Canyon	2002	PFC		1.395
LO0071	Varney Creek	2002	PFC		2.572
LO0072	Varney Creek	2002	PFC		2.87
LO0073	Scorpion Gulch	2002	PFC		0.595
LO0074	Scorpion Gulch	2002	PFC		1.975

Table 2-7
PFC Assessment Results for Lotic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend	Miles
LO0075	Birch Creek	2002	FAR	UPWARD	2.305
LO0076	Birch Creek	2002	FAR	DOWNWARD	3.608
LO0077	Left Hand Varney Creek	2002	FAR	UPWARD	0.994
LO0078	Hurricane Wash	2002	PFC		1.632
LO0100	4 Mile	2001	FAR	DOWNWARD	0.916
LO0102	4 Mile	2001	PFC		0.999
LO0103	4 Mile	2001	FAR	NOT APPARENT	1.801
LO0104	Tommy Smith	2001	FAR	UPWARD	4.194
LO0106	Wahweap	2001	FAR	UPWARD	2.978
LO0107	Headquarters Cabin Wash	2001	NF		0.361
LO0108	Hackberry	2001	PFC		1.882
LO0109	Hackberry	2001	PFC		1.588
LO0110	Hackberry	2001	FAR	NOT APPARENT	0.826
LO0111	Hackberry	2001	FAR	UPWARD	0.903
LO0112	Hackberry	2001	PFC		2.744
LO0113	Hackberry	2001	PFC		1.83
LO0114	Willis	2001	NF		2.886
LO0115	Willis	2001	NF		2.09
LO0116	Willis	2001	FAR	DOWNWARD	0.202
LO0117	Willis	2001	NF		1.173
LO0118	Paria	2001	FAR	UPWARD	9.263
LO0119	Paria	2001	NF		1.374
		2007	NF		1.374
LO0120	Paria	2001	FAR	NOT APPARENT	0.883
		2007	FAR	UPWARD	0.883
LO0121	Sheep Creek	2001	FAR	UPWARD	0.828
LO0122	Heward Creek	2001	FAR	NOT APPARENT	0.426
LO0123	Heward Creek	2001	PFC		0.18
LO0127	Henrieville	2001	FAR	UPWARD	2.842
LO0128	Henrieville	2001	FAR	NOT APPARENT	2.664
LO0129	Henrieville	2001	PFC		1.843
LO0130	Little Creek	2001	PFC		2.529
LO0131	Little Creek	2001	PFC		1.482
LO0135	Bullrush Hollow	2001	NF		1.198
LO0137	North Canyon	2001	FAR	NOT APPARENT	2.618
LO0138	Henrieville	2001	FAR	NOT APPARENT	2.024
LO0139	Henrieville	2001	NF		0.361
LO0140	Little Creek	2001	NF		1.619

Table 2-7
PFC Assessment Results for Lotic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend	Miles
LO0141	Gulch	2001	PFC		6.997
LO0142	Gulch	2001	FAR	NOT APPARENT	1.091
LO0143	Boulder Creek	2001	PFC		4.185
LO0144	Boulder Creek	2001	PFC		1.214
LO0145	Gulch	2001	PFC		1.13
LO0146	Unnamed	2001	PFC		0.45
LO0147	Gulch	2001	FAR	DOWNWARD	4.418
		2007	FAR	NOT APPARENT	4.418
		2012	NOT RATED		4.418
LO0148	Unnamed	2001	PFC		0.363
LO0149	Gulch	2001	PFC		1.236
LO0150	Water Canyon	2001	PFC		1.455
		2012	PFC		1.455
LO0151	Boulder Creek	2001	FAR	NOT APPARENT	5.869
LO0152	Gulch	2001	FAR	DOWNWARD	2.736
		2007	PFC		2.736
LO0153	Gulch	2001	FAR	NOT APPARENT	2.208
		2007	FAR	DOWNWARD	2.208
LO0154	Unnamed (Laminite Arch)	2001	FAR	NOT APPARENT	1.485
		2007	FAR	NOT APPARENT	1.485
LO0155	Deer Creek	2001	PFC		3.634
LO0157	Hot Canyon Reach 1	2002	PFC		0.648
LO0158	Hot Canyon	2002	FAR	NOT APPARENT	1.358
LO0159	Slickrock Canyon	2002	PFC		2.855
LO0160	Cottonwood	2002	PFC		4.429
LO0161	Deer Creek	2002	PFC		1.762
LO0162	Pleasant Grove	2002	FAR	DOWNWARD	0.453
		2007	FAR	UPWARD	0.453
LO0163	S. tributary to Pleasant Grove	2002	PFC		0.239
LO0164	Pinto Mare	2002	PFC		0.417
LO0165	Glass Eye	2002	PFC		0.219
LO0166	Seaman	2002	PFC		0.271
LO0167	Seaman	2002	PFC		0.118
LO0168	Seaman	2002	FAR	DOWNWARD	0.127
LO0169	Steer	2002	FAR	UPWARD	0.934
LO0170	Unnamed 1 (tributary to Blackburn Canyon)	2002	FAR	DOWNWARD	0.715
LO0171	Unnamed	2002	PFC		0.231

Table 2-7
PFC Assessment Results for Lotic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend	Miles
LO0173	Rock	2002	FAR	NOT APPARENT	0.147
LO0174	Rock	2002	PFC		0.38
LO0175	Boulder Creek	2002	PFC		4.175
LO0176	Deer Creek	2002	FAR	NOT APPARENT	1.762
LO0177	Boulder	2002	PFC		0.979
LO0178	Snake	2002	FAR	NOT APPARENT	0.504
LO0179	Snake	2002	PFC		0.544
LO0180	Calf Creek	2002	PFC		2.912
LO0181	Calf Creek	2002	PFC		1.019
LO0182	Deer Creek	2002	PFC		2.412
LO0183	Deer Creek	2002	PFC		3.342
LO0184	Sand Hollow	2002	PFC		0.835
LO0186	Hog Eye	2002	PFC		0.842
LO0187	Kitchen Canyon	2002	FAR	NOT APPARENT	1.32
LO0190	Lower Reese Canyon	2002	PFC		1.174
LO0196		1997	PFC	NOT APPARENT	12.39
LO0197	Escalante River	1997	PFC	NOT APPARENT	7.223
LO0198	Escalante River	1997	PFC	NOT APPARENT	14.481
LO0199	Escalante River	1997	PFC	NOT APPARENT	5.893
LO0200	Escalante River	2003	PFC	NOT APPARENT	7.356
LO0202	Death Hollow	2003	PFC	NOT APPARENT	13.913
LO0203	Willow Patch	2003	PFC	NOT APPARENT	2.562
LO0204	Escalante River	2003	PFC	NOT APPARENT	6.729
LO0205	Sand Creek	2003	PFC	NOT APPARENT	13.103
LO0206	Butler Valley Seeps	2003	PFC	NOT APPARENT	0.282
LO0207	Upper Valley	2003	NF	NOT APPARENT	7.346
LO0208	Upper Valley	2003	NF	NOT APPARENT	0.401
LO0210	Sweetwater	2003	PFC	NOT APPARENT	1.79
LO0211	Forty Mile Gulch	2003	PFC	NOT APPARENT	1.048
LO0212	Forty Mile Gulch	2003	PFC	NOT APPARENT	1.951
LO0213	Willow Gulch	2003	PFC	NOT APPARENT	1.454
LO0214	Willow Gulch	2003	PFC	NOT APPARENT	0.528
LO0215	Fifty Mile Gulch	2003	PFC	NOT APPARENT	2.217
LO0404	Flood Canyon Mouth	1999	FAR	NOT APPARENT	0
		2007	FAR		0
LO0406	Lower Bullrush	1999	NF	NOT APPARENT	0
		2010	FAR	UPWARD	0
LO0407	Upper Bullrush Hollow	1999	NF	DOWNWARD	0
LO0408	Bullrush Hollow	1993	NF		1.198

Table 2-7
PFC Assessment Results for Lotic Sites

ID	Riparian/Wetland Area	Year Assessed	Rating[1]	Trend	Miles
LO0501	Stone Donkey	2001	FAR	UPWARD	0.12
LO0502	Stone Donkey	2001	PFC		0.106
LO0503	Rush Beds	2001	PFC		0.119
		2014	FAR	UPWARD	0.119
LO0504	Pump Canyon	2001	NF		0.095
		2014	FAR	UPWARD	0.095
LO0505	N/A	2001	FAR	NOT APPARENT	0.237
		2014	PFC		0.237
LO0506	N/A	2001	PFC		0.277
LO0507	Nipple Spring	2001	FAR	DOWNWARD	0.412
		2007	FAR	UPWARD	0.412
LO0508	Cottonwood Gulch	2002	PFC		0.862
LO0510	East Spencer Draw	2003	PFC		0.309
LO0511	Lake Draw	2003	PFC		0.746
LO0512	Rogers Canyon	2003	FAR	DOWNWARD	0.68
LO0513	Croton Canyon	2003	FAR	NOT APPARENT	0.503
LO1000	Lake	2002	PFC		0.52
LO1001	Lake	2002	PFC		0.601
LO1002	Long Valley Canyon	2001	FAR	NOT APPARENT	0.327
LO1003	Long Valley Canyon	2001	PFC		1.382
LO1004	Long Valley Canyon	2001	FAR	DOWNWARD	0.417
LO1005	Camp Spring/R. Hand Collet	2003	NF		0.789
		2012	FAR	NOT APPARENT	0.559
LO1006	Middle R. Hand Collet	2003	NF		0.463
		2012	NOT RATED		0.463
LO1007	Sarah Anne	2001	NF		0.275
		2012	FAR	NOT APPARENT	0.275
LO1008	Lower R. Hand Collet	2003	FAR	NOT APPARENT	3.205
		2012	PFC		2.707
LO1009	Left Hand Collet	2003	FAR	NOT APPARENT	0.88

Source: BLM GIS 2014a
PFC: proper functioning condition
FAR: functioning at risk
NF: non-functional

Noxious Weeds and Nonnative, Invasive Plants

Invasive plants are found in the planning area, particularly in areas disturbed by surface activities. These plants displace native plant communities and degrade wildlife habitat. Table 2-8, Utah Noxious Weeds Occurrence, lists the Utah designated noxious weeds that may occur in the region, the current management classes for each species, and their occurrence in the planning area. In addition, Russian olive (*Elaeagnus angustifolia*), camelthorn (*Alhagi pseudalhagi*), and Ravenna grass (*Saccharum ravennae*) occur in Glen Canyon.

Table 2-8
Utah Noxious Weeds Occurrence

Common Name	Scientific Name	Class	Occurrence[1]
Bermudagrass	*Cynodon dactylon*	B	X
Canada thistle	*Cirsium arvense*	C	
Dalmatian toadflax	*Linaria dalmatica*	B	
Diffuse knapweed	*Centaurea diffusa*	A	
Dyers woad	*Isatis tinctoria*	B	
Field bindweed	*Convolvulus arvensis*	C	X
Hoary cress	*Cardaria* spp.	B	X
Houndstongue	*Cynoglossum officinale*	C	
Johnsongrass	*Sorghum halepense*	A	X
Musk thistle	*Carduus nutans*	B	
Perennial pepperweed	*Lepidium latifolium*	B	
Poison hemlock	*Conium maculatum*	B	X
Purple loosestrife	*Lythrum salicaria*	A	
Quackgrass	*Elytrigia repens*	C	X
Russian knapweed	*Acroptilon repens*	B	X
Tamarisk (salt cedar)	*Tamarix* spp.	C	X
Scotch thistle	*Onopordum acanthium*	B	X
Spotted knapweed	*Centaurea biebersteinii*	A	
Squarrose knapweed	*Centaurea virgate*	B	
Yellow starthistle	*Centaurea solstitialis*	A	

Sources: Utah Weed Control Association 2014; Belliston et al. 2009
[1]Includes species that occur or have occurred in or near the planning area.

Class A weeds have a relatively low population size within the state and are of highest priority; they are considered an *Early Detection Rapid Response* weed.

Class B weeds have a moderate population throughout the state and generally are thought to be controllable in most areas.

Class C weeds are found extensively in the state and are thought to be beyond control. Statewide efforts would generally be toward containment of smaller infestations.

In the Colorado Plateau ecoregion, cheatgrass (*Bromus tectorum*) has been identified as a significant change agent; the species can alter ecosystem processes, such as fire regimes, has the potential to expand in distribution in spite of human and natural disturbances, and adapts and shifts its range in response to climate change (Bryce et al. 2012, p. 96). However, cheatgrass is

not considered as much of a threat in the planning area compared to other parts of the ecoregion.

The BLM has inventoried and mapped some of the planning area to determine the extent of invasive plants. In 2012, the BLM inventoried more than 4,600 acres in the Alvey Wash watershed, focusing on Russian olive and tamarisk. Other targeted species included hoary cress, Russian knapweed, and perennial pepperweed, though no infestations of these species were identified. Within the inventoried area, biologists detected nearly 150 acres of Russian olive and more than 200 acres of tamarisk (Edvarchuk and Ransom 2012, p. 39). Rangeland health assessments found that tamarisk (found at 68 percent of riparian sites), yellow clover (37 percent), and cheatgrass (32 percent) were common at riparian sites assessed between 2000 and 2003 (BLM 2006). Cheatgrass is the predominant nonnative, invasive species in upland sites, having been found in 54 percent of sites assessed; cheatgrass was a dominant species in over 20 percent of those sites (BLM 2006).

Trends

Upland Vegetation

Vegetation communities in the Colorado Plateau ecoregion and within the planning area have historically been affected primarily by invasive species conversion and uncharacteristic native vegetation (such as pinyon-juniper expansion). REA data show that the largest changes within the planning area occur in mixed mountain shrubland, where over 85 percent has been affected by uncharacteristic native vegetation, likely pinyon-juniper expansion. Pinyon-juniper shrubland has also experienced substantial changes, with over 20 percent affected by invasive grasses. Disturbances, such as fire and particularly mechanical treatments, have also affected vegetation communities in the planning area. The greatest effects from disturbances have occurred in the big sagebrush shrubland community, with 10 percent of the vegetation community affected (BLM GIS 2014a; REA GIS 2012). Other influences in the ecoregion include urbanization and roads, agriculture, and fire, though these have had less of an effect in the planning area (Bryce et al. 2012, p. 86; BLM GIS 2014a; REA GIS 2012). Depending on the characteristics of the plant community and the type and intensity of grazing, livestock grazing has also had effects on vegetation, such as changes in plant species composition, aboveground primary productivity, and root and soil attributes (Milchunas 2006).

Rangeland health assessments and range monitoring indicate trends and issues in different vegetation communities. These trends are not always in agreement with the larger-scale REA data. This is because the rangeland health assessments are site specific, evaluating on-the-ground conditions. Most oak woodland and pinyon-juniper communities evaluated during rangeland health assessments had none to slight departure from reference conditions (BLM 2006). Many of the blackbrush, sagebrush grassland seedings, desert shrub, and grassland and meadow sites showed moderate, moderate to extreme, and extreme departures from reference conditions (BLM 2006).

Departures from reference conditions for upland vegetation identified in Rangeland Health Assessments are as follows (BLM 2006):

1. Blackbrush—Soil erosion, exotic invasion, and loss of species composition

2. Desert shrub—Shifts in species composition, exotic invasion, soil loss, and soil erosion
3. Sagebrush grassland seedings—Reduction in biological soil crust, shift in functional/structural groups, increased soil erosion, and bare ground
4. Seedings—Soil stability, desirable species composition, seeded species die-off, and increased cover of exotic annual plants, such as cheatgrass and scotch thistle

In addition, desert and semidesert sand ecological sites, originally a shrub-steppe type composed of *Atriplex canescens*-bunchgrass (*Achnatherum* and *Hesperostipa*) show some of the greatest departures from historical conditions. This appears to be due primarily to overgrazing in the past, possibly before World War II. This eliminated biological soil crusts and grass cover, followed by wind mobilization of sands, especially during periods of drought (personal communication with NPS 2015).

Pinyon-juniper woodlands have expanded over the last century into grassland and shrubland ecosystems throughout the western US. Livestock grazing, changes in fire regimes, and increasing atmospheric carbon dioxide concentrations are thought to be more recent drivers of pinyon-juniper woodland distribution. However, one study suggests that past climate has been more important than livestock grazing in influencing pinyon-juniper persistence in the planning area (Barger et al. 2009, p. 536). Further, many old (over 200 years) pinyon pines were found within the planning area, indicating that pinyon pines have long been established within the planning area (Barger et al. 2009, p. 537). As such, juniper is likely the predominant species that expanded in the planning area.

Riparian and Wetland Vegetation

Riparian systems throughout the Colorado Plateau ecoregion have experienced substantial changes due to direct conversion to other uses, changes in the natural flow regimes and suppression of fluvial processes, livestock grazing, and invasive species (e.g., tamarisk) (Bryce et al. 2012, p. 88). Given their productivity and importance to animals, riparian areas have a greater potential to be impacted by livestock grazing compared with adjacent less productive communities, but also potential for more rapid recovery from disturbance because of faster growth rates of the vegetation (Milchunas 2006, p. 80).

In the planning area, PFC assessments noted impacts from heavy use by livestock of riparian and wetland areas, such as increased sloughing and erosion of banks from hoof action and trampling of vegetation near springs, in many of the allotments assessed. Other impacts noted included dewatering, loss of riparian and wetland vegetation, poor recruitment of native species, and replacement of native species by tamarisk, Russian olive, and annual grasses and forbs. In many areas, a change to existing grazing administration was identified as needed to meet or make significant progress toward meeting the rangeland health standard for riparian and wetland areas (BLM 2006). To address these issues, the BLM and permittees have taken a variety of measures, as presented in Table 2-4, Allotments Not Meeting Rangeland Health Standards Due to Livestock Grazing in 2006, including coordinating voluntary nonuse, removing feral cattle, fencing springs and seeps, repairing existing infrastructure, and changing season of use.

Since 2000, monitoring has occurred on approximately 360 miles of streams (i.e., lotic reaches) and at more than 100 seeps or springs (i.e., lentic sites). The BLM has conducted additional PFC assessments in the Circle Cliffs, Collet, Cottonwood, Ford Well, Fortymile Ridge, Headwaters, Hells Bellows, Last Chance, Lower Cattle, Mollies Nipple, Soda, Swallow Park, Upper Paria, and Vermilion allotments since those assessments done for the 2006 rangeland health determinations (see Tables 2-6 and 2-7).

In 2013, Garfield County contracted riparian PFC assessments on all riparian areas in the Cottonwood, Death Hollow, Lower Cattle, Mollies Nipple, and Soda allotments. These allotments are part of a group of 18 allotments found to be not meeting Standard 2 in the 2006 rangeland health determinations for GSENM.

The results of these assessments indicated that the BLM management actions to correct riparian issues associated with livestock grazing improved rangeland health. The report by the Garfield County contractor (Stager's Environmental Consulting 2014) concludes that Cottonwood, Death Hollow, and Lower Cattle allotments are likely meeting land health standards as a result of BLM management. The report also concludes that Mollies Nipple and Soda allotments are likely not meeting land health standards due to livestock grazing, but that the BLM has made measureable progress toward meeting standards since the 2006 determination (Stager's Environmental Consulting 2014). Overall, most of the riparian and wetland sites evaluated show an improvement.

Noxious Weeds and Nonnative, Invasive Plants

As ground disturbance and human visitation increase in areas of known populations, the likelihood that noxious weeds and invasive plants would move into this disturbance also increases. Another source of potential noxious weed and invasive plant infestations is routine monument operations, such as road maintenance, firefighting, and even weed control operations (Edvarchuk and Ransom 2012, p. 41). Focused efforts have limited the spread and reduced the size of invasive plant populations in areas. Such efforts include spot treatment of noxious weeds; pre-emergent herbicide application prior to seeding (targeting cheatgrass); mowing or Dixie harrowing and seeding; prescribed fire use; and follow-up seeding with native species post-treatment.

Over a six-year study in the planning area, researchers identified the following patterns across the landscape related to invasive plants:

1. Native and nonnative plant species thrive in rare, mesic habitats that are high in soil fertility, moisture, and foliar cover.
2. Highly disturbed habitats, such as post-burn areas, have exceedingly high levels of plant invasions related to the destruction of soil crusts and local displacement of native species by nonnative species.
3. More common xeric habitats are high in endemic species and have considerably lower nonnative species and cover.
4. Plant species life history can be an important predictor of successful invasion because it integrates specific environmental variables (Stohlgren et al. 2006, p. 282).

Forecast

Upland Vegetation

Climate change may affect vegetation particularly as temperature increases interact with water limitations. In many vegetation communities, canopy cover of perennial plants has been shown to be sensitive to temperature, whereas canopy cover of annual plants responds to cool season precipitation (Munson et al. 2011, p. 1). REA models predict increasing temperatures in all seasons. For 2015 to 2030, reductions in both the winter and summer precipitation (reduction in the monsoon) are expected; for 2045 to 2060, a slight increase in annual precipitation is expected, particularly during winter.

Winter precipitation is critical to perennial native plants and it enhances annual productivity for certain species (Bryce et al. 2012, p. 145). If both winter and summer precipitation is reduced, trees, especially pinyon pine, and grasses may be reduced (Schwinning et al. 2008 in Bryce et al. 2012, p.145; Munson et al. 2011, p. 1; Barger et al. 2009, p. 537), while shrubs are likely to continue to expand (Munson et al. 2011, p. 1). For woody species, drought-induced water stress has been linked to bark beetle infestations leading to die-off (Breshears et al. 2005, p. 15147). However, interspecific competition may play a role in mediating the effects of climate change (Derner et al. 2003, p. 458).

The REA model predicts the contraction of some of the drier shrublands (sagebrush in particular), savanna pinyon-juniper, and some evergreen forest, by 2060, while grasses are expected to expand in the ecoregion (Bryce et al. 2012, p. 145). Within the planning area, the REA predicts a 26 percent reduction in evergreen tree savanna, such as ponderosa pine, and 17 percent reduction in evergreen shrub savanna, such as sagebrush and saltbrush. The largest expansions are predicted in grasslands, such as those composed of sandhill muhly and blue grama, with up to a twenty-fold predicted increase (BLM GIS 2014a; REA GIS 2012). For both the 2015 to 2030 and 2045 to 2050 periods, the seasonality and intensity of precipitation will be a key factor. If the trend is toward wetter winters or springs, the invasive grasses, such as cheatgrass, will spread and burn in the summer and fall, reinforcing their persistence over larger areas. If multiple wet years occur, grasses may have the advantage over shrubs in establishment and survival (Peters 2011 in Bryce et al. 2012, p. 145).

Riparian and Wetland Vegetation

Based on recent PFC assessments, the condition of riparian and wetlands is improving on the allotments assessed (BLM PFC assessments; Stager's Environmental Consulting 2014). As the BLM makes additional management adjustments for livestock grazing on these and other allotments not meeting Standard 2, the overall riparian and wetland condition will improve.

Given the presence of the tamarisk leaf beetle, it is expected that tamarisk will reduce in density. Depending on future management, this could allow for the natural recolonization of native riparian vegetation, or other exotic species may become established.

Noxious Weeds and Nonnative, Invasive Plants

The BLM expects noxious weeds and nonnative, invasive plant species to continue to spread in many areas. The REA predicts an 85 percent increase in invasive species distribution within the planning area by 2025 (BLM GIS 2014a; REA GIS 2012). In some areas, control efforts will

eradicate species locally. The degree to which these species spread is directly correlated to human activities and control efforts in the area. Some of these species are very invasive and readily transported to uninfested areas. Surface-disturbing activities and vehicular travel mainly contribute to weed proliferation, although natural elements, such as wind and wildlife, will likely also contribute. Range animals, such as livestock and feral and domesticated horses, will also increase the opportunities for invasive plant species to spread and become established through transfer or if improper grazing management practices occur through overgrazing.

Noxious weeds and nonnative, invasive plants will be more likely to establish in newly disturbed areas, especially near existing populations. Since management in the planning area discourages development, these areas are likely to be localized and easily treated.

While it is difficult to predict future introductions of noxious weeds and nonnative, invasive species, the most likely areas for introduction are those where new disturbances occur. Historic evidence indicates that new weed species introduced to the planning area will establish if not eradicated immediately.

Control of noxious weeds and nonnative, invasive plants would depend on the cost and feasibility of available treatment methods. Resource management strategies are in place that would contribute to maintaining current levels or reducing the expansion of these species. Examples of these strategies are minimizing surface disturbance and surface-disturbing activities, requiring prompt reclamation of these disturbed areas, reducing traffic through infested areas, and using fire suppression tactics. Research continues to develop new herbicide formulations and test the effectiveness of biological agents, including pathogens, as tools to control weed species.

Key Features

The Proclamation establishing GSENM identifies the following objects related to vegetation: hanging gardens, tinajas, rock crevice, canyon bottom, and dunal pocket floristic communities; endemic plants and their pollinators; relict plant communities, including No Man's Mesa; pinyon-juniper communities with up to 1,400 year old trees; and riparian corridors (see Section 5.4, GSENM Proclamation and Objects).

Utah has one of the highest rates of endemism[1] in the US and Kane and Garfield Counties have the highest rate of endemism in Utah. Many endemic species are also rare due to their restricted range. There are about 125 species of plants in GSENM that occur only in Utah or on the Colorado Plateau and 11 species of plants in GSENM are found nowhere else (Belnap 1997).

Relict plant communities are areas that have persisted despite the climate changes that have occurred in the west over the last few thousand years (Betencourt 1984 in BLM 2000, p. 25) and/or have not been influenced by settlement and post-settlement activities (such as domestic livestock grazing). This isolation, over time and from disturbance, has created unique areas that can be used as a baseline for gauging impacts occurring elsewhere in GSENM and on the Colorado Plateau (BLM 2000).

[1] When a species occurs exclusively in a defined geographic location

Hanging gardens occur where groundwater surfaces along canyon walls from perched water tables or from bedrock fractures. The existence of hanging gardens is dependent on a supply of water from these underground water sources. The geologic and geographic conditions for hanging gardens exist throughout southern Utah (Welsh and Toft 1981 in BLM 2000, p. 25), including in GSENM. Due to the conditions of isolation produced in hanging gardens, there is a potential for unique species in these areas (BLM 2000).

Data Gaps

GSENM has been implementing the BLM-wide assessment, inventory, and monitoring (AIM) strategy for land health assessment since 2013. Its purpose is to provide scientifically sound and technically defensible multi-scale monitoring of multiple resource conditions to support management and decision-making. The BLM does this partly through improved probabilistic sampling design and standardized inventory, assessment, and monitoring methods. Initially, it has applied the strategy to assess and monitor land health for both land use planning (large scale) and grazing administration (smaller, allotment scale). Applications are as follows:

1. Determining plant community composition (to allow spatially explicit estimates of forage availability using ecological site descriptions)
2. Evaluating options for integrating AIM's probabilistic sampling design into the existing key area-based monitoring framework, while preserving the utility of historic data to establish trends in vegetation condition and plant community structure

Results compare forage production estimates from ecological site descriptions based on the determination of state and community phase from AIM data with those determined from rangeland health monitoring. Resampling and simulation modeling of existing nonprobabilistic data provide estimates of the temporal and spatial representativeness of those data and allow comparison with those from AIM sampling. Evaluations of allotment condition for grazing management based on existing, key area-based data can be supplemented with AIM data.

In 2013, the BLM collected AIM data on one complete allotment (Death Hollow) and part of another (Last Chance). In 2014, it revised the sampling design away from individual allotments to the entire GSENM in order to more quickly demonstrate the utility of AIM data. The sampling design is a stratified random sampling, where strata are based on ecological sites lumped by precipitation class (desert, semidesert, and upland) and by potential vegetation, then weighted by area-wide potential production. More high-production sites are sampled than low-production sites; this is based on the belief that 1) they are likely more heterogeneous and 2) their condition will have a greater effect on planning and administering use. Over 5 years, 500 points will be sampled, balanced spatially and across strata each year. By sampling across all ecological sites found in the plan area and sampling across all strata each year, the BLM is gathering data representative of the entire plan area from the first year. The dataset will become a progressively more accurate representation with each subsequent year.

The BLM is also conducting a research project with Northern Arizona University. It will evaluate options for integrating AIM's probabilistic sampling design into the existing key area-based

monitoring framework, while preserving the utility of historic data to establish trends in vegetation condition and plant community structure.

Two years of data have been collected, but it should not yet be used to make conclusions about trends. As previously mentioned, the sampling design changed between 2013 and 2014 so that representative points of all strata are sampled in a given year, as opposed to focusing on allotments. While this change in design will allow the dataset to become a progressively more accurate representation of the Monument each year, more sample years are needed to improve the confidence in extrapolating the data to represent the Monument.

The BLM does not have site-specific surveys for noxious weeds and nonnative, invasive plants.

2.3 WATER

Regional Context

The planning area is within the Colorado Plateau ecoregion, which is an erosional landscape with wind and water working on layers of sedimentary rock. The Colorado Plateau receives winter precipitation from the Pacific Ocean and variable amounts of summer rain, such as monsoons. Human activities cover urban and industrial development, surface and groundwater extraction, recreation, agriculture, grazing, and the introduction of invasive plants. Across the ecoregion, variability in geology, physiography, elevation, aspect, ground and surface water availability, and soil (texture, depth, and water-holding capacity) is reflected in patterns of vegetative cover. The *Current Condition* section below describes the condition of specific water resources for the planning area.

Indicators

Indicators of the condition of water resources are the following:

1. State and federal water quality standards
2. Water uses
3. BLM Utah's Standards for Rangeland Health and Guidelines for Grazing Management

Current Condition

Precipitation

In general, the average annual precipitation for the planning area is 10 to 20 inches, with areas around Lake Powell receiving less than 10 inches and areas north-northeast of Kanab, Utah, receiving 20 to 30 inches (Utah Division of Water Resources 2014). Escalante, Utah, has an average annual precipitation of 11 inches (Western Regional Climate Center 2014).

Surface Water Sources

Although water shaped much of the terrain of the planning area, there are limited sources of surface water. All the water in this region flows into the Colorado River (whether above or below Glen Canyon Dam).

The Escalante River system, the main stem and many tributaries of which are perennial, flows from the Aquarius Plateau into the upper portions of Lake Powell. Above the town of Escalante, most of the river's flow is diverted seasonally to Wide Hollow Reservoir for irrigation of agricultural lands.

Last Chance Creek and Wahweap Creek are the primary tributaries off the Kaiparowits Plateau, flowing into the main body of Lake Powell. Wahweap Creek and Last Chance Creek are perennial only along portions of their length.

The Paria River sub-basin (including Hackberry Creek and Cottonwood Creek) extends from the Bryce Canyon-Bryce Valley area, terminating below Glen Canyon Dam near Lee's Ferry. The Paria River subbasin is perennial from below the town of Cannonville downstream to below the confluence of Cottonwood Creek, and then becomes intermittent to the Colorado River. The upper reaches of the Paria River are intermittent and often diverted for irrigation of agricultural lands in the Tropic/Cannonville area.

On the west side of the planning area, the Kanab Creek sub-basin (including Johnson Wash and its tributaries) drains into the Grand Canyon. There are approximately 8,285 miles of streams and washes (BLM GIS 2014a). Approximately 96 percent of these are intermittent or ephemeral. Figure 2-3, Surface Water, shows the locations of surface water sources in the planning area.

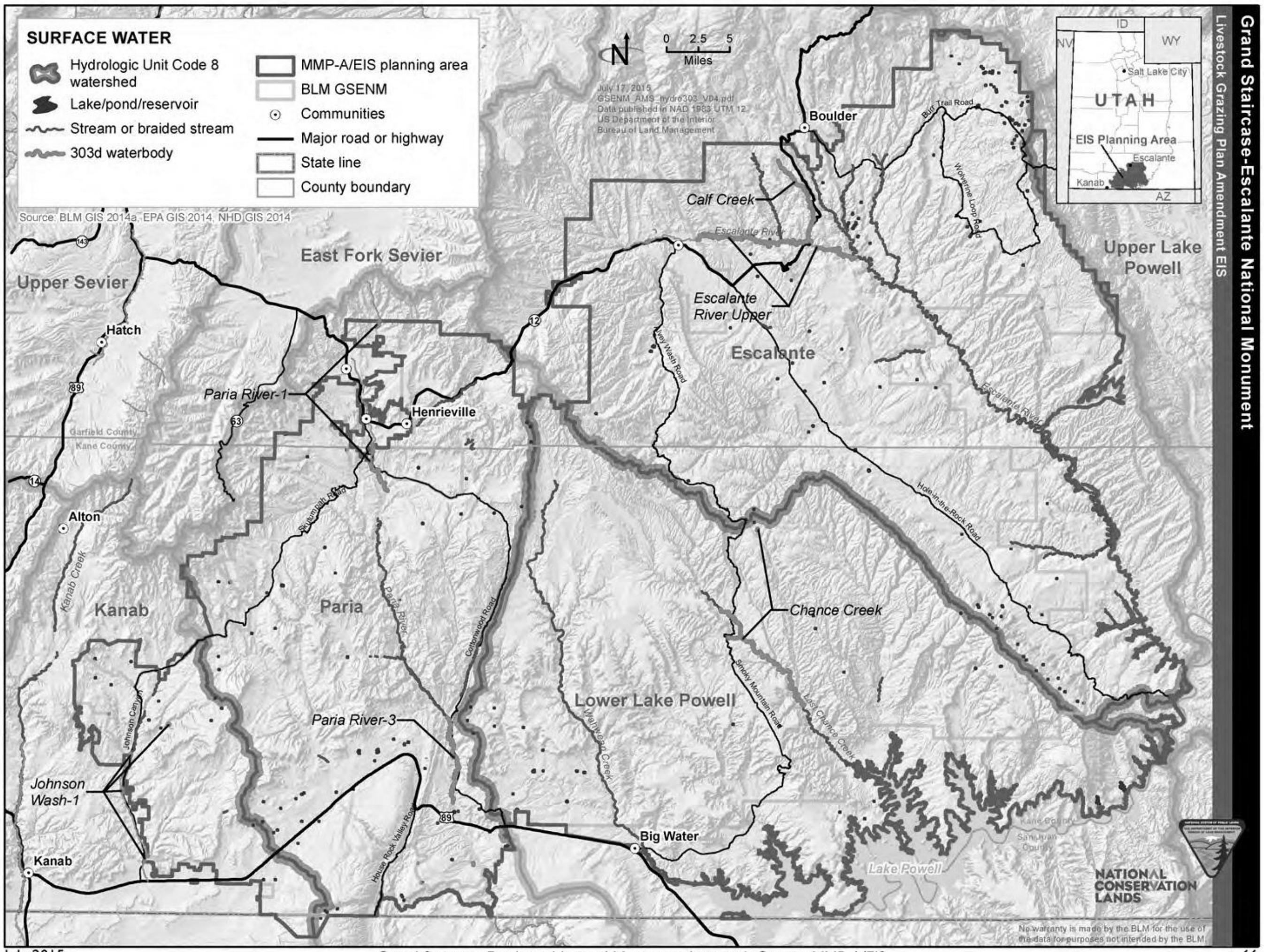
Groundwater Sources

The Colorado Plateau aquifers underlie the planning area (Robson and Banta 1995). The Colorado Plateau aquifers underlie an area of approximately 110,000 square miles in western Colorado, northwestern New Mexico, northeastern Arizona, and eastern Utah. In general, the aquifers in the Colorado Plateau area are composed of permeable, moderately to well-consolidated sedimentary rocks. Much of the land in this sparsely populated region is underlain by rocks that contain aquifers capable of yielding usable quantities of water of a quality suitable for most agricultural or domestic use. Groundwater quantity and quality in the Colorado Plateau aquifers are extremely variable.

There are several aquifer systems underlying GSENM. The major aquifer system is within the Navajo Sandstone and underlying sandstones that exist in most parts of GSENM. This system is part of a regional aquifer system that encompasses parts of Colorado, Arizona, and Utah and is now called the Glen Canyon aquifer. This aquifer is recharged partly by precipitation that infiltrates the Navajo Sandstone where it crops out in the northeastern and southwestern parts of GSENM, and partly by snowmelt and rainfall that infiltrate the higher plateaus to the north and the Kaiparowits Plateau where the water must move down through overlying strata before it reaches the Glen Canyon aquifer. The Glen Canyon aquifer sustains part of the base flow in Johnson Creek, the Paria River, and the Escalante River and its tributaries (Freethey 1997).

Other regional aquifers exist under GSENM. The Kaiparowits Plateau includes the Mesa Verde, the Dakota, the Morrison, and the Entrada-Preuss aquifers that overlie the Glen Canyon aquifer. Carbonate aquifers of Paleozoic age underlie all of GSENM, but are largely inaccessible because of depth. Direction of groundwater movement, estimated from water levels from a few wells and from knowledge about the nature of recharge to aquifers, is from the northwest to the

Figure 2-3


SURFACE WATER
Hydrologic Unit Code 8 watershed
Lake/pond/reservoir
Stream or braided stream
303d waterbody
MMP-A/EIS planning area
BLM GSENM
Communities
Major road or highway
State line
County boundary
Source: BLM GIS 2014a, EPA GIS 2014, NHD GIS 2014
N
0 2.5 5
Miles
Grand Staircase-Escalante National Monument
Livestock Grazing Plan Amendment EIS
UTAH
Salt Lake City
EIS Planning Area
Escalante
Kanab
ID
WY
NV
AZ
Boulder
Calf Creek
East Fork Sevier
Upper Sevier
Upper Lake Powell
Escalante River Upper
Escalante
Hatch
Paria River-1
Henrieville
Alton
Kanab
Paria
Chance Creek
Lower Lake Powell
Paria River-3
Johnson Wash-1
Big Water
Lake Powell
NATIONAL CONSERVATION LANDS
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM

southeast, toward Lake Powell. From meager data sites, it is thought that, locally, groundwater moves toward and discharges into the deepest canyons. Thickness of these regional aquifers ranges from 200 feet for the Dakota aquifer to 2,200 feet for the Glen Canyon aquifer (Freethey 1997).

Water Quality

Every other year, the Utah Department of Environmental Quality, Division of Water Quality compiles all readily available data and conducts analyses to determine whether water quality is sufficient to meet the beneficial uses assigned to waters in Utah (Utah Department of Environmental Quality 2014). The 303(d) List is a list of impaired waters that fail to meet water quality standards or are biologically impaired. Table 2-9, Utah 303(d) Listed Waters for Reporting Year 2010, identifies the waters in the decision area that are on the 303(d) List and their reason for being on the list, and Figure 2-3, Surface Water, shows the locations of the waters in the decision area that are on the 303(d) List. An updated water quality assessment and 303(d) list has been submitted to the EPA for approval. Data reported here are from the 2010 reporting year.

According to the 303(d) report, the probable sources contributing to impairment are largely unknown; however, where known they do not include livestock (grazing or feeding operations), grazing in riparian or shoreline zones, or rangeland grazing. In some cases, livestock grazing may contribute to water quality impairment, whether by direct effects, such as those of animal waste on dissolved oxygen or nutrients (nitrogen or phosphorus), or by indirect effects, such as by increasing erosion, which increases sediment loading (turbidity), total dissolved solids, and associated metals. Such effects may also impair benthic macroinvertebrate and fish habitat and result in low observed/expected bioassessments.

The following livestock grazing allotments contain waters in the decision area that are on the 303(d) List:

Johnson Canyon	Granary Ranch	Hells Bellows
Upper Paria	Cottonwood	Wide Hollow
Headwaters	Willow Gulch	Haymaker Bench
Phipps	Last Chance	

Water quality management plans exist for the Escalante River and Paria River watersheds (Millennium Science & Engineering, Inc. undated[a] and undated[b]). The primary potential source of water temperature alteration within GSENM is from livestock grazing (Millennium Science & Engineering, Inc. undated[a]). Water temperature alteration can still occur even if it is not severe enough to create impaired waters that fail to meet water quality standards. The BLM has worked with permittees to gradually reduce the potential effect of livestock grazing. The BLM closed livestock grazing allotments along the main stem Escalante River, in Sand and Death Hollow watersheds in 1999, primarily to improve riparian and wildlife habitat and reduce livestock recreation conflicts. The BLM has implemented projects since adoption of the plan to restore altered watersheds and improve conditions (Millennium Science & Engineering, Inc. undated[a]).

Table 2-9
Utah 303(d) Listed Waters for Reporting Year 2010

Water Body Name	Water Body ID	Location	Cause of Impairment	Cycles Listed	Size	Probable Source Contributing to Impairment
Calf Creek	UT14070005-007_00	Calf Creek and tributaries from confluence with Escalante River to headwaters	Temperature, Water	2008, 2010	8 miles	Unknown
Escalante River Upper	UT14070005-012_00	Escalante River from Boulder Creek confluence to Birch Creek confluence	Benthic Macro-invertebrates Bioassessments	2008, 2010	19 miles	Unknown
Last Chance Creek	UT14070006-004_00	Last Chance Creek and tributaries from Lake Powell to headwaters	Benthic Macro-invertebrates Bioassessments	2008, 2010	17 miles	Unknown
Paria River-1	UT14070007-001_00	Paria River from start of Paria River Gorge to headwaters	Benthic Macro-invertebrates Bioassessments	2008, 2010	4 miles	Unknown
			Temperature, Water	2008, 2010		Drought-Related Impacts
			Total Dissolved Solids	2000, 2002, 2004, 2006, 2008, 2010		Agriculture, Natural Sources
Paria River-3	UT14070007-005_00	Paria River and tributaries from Arizona-Utah state line to Cottonwood Creek confluence	Benthic Macro-invertebrates Bioassessments	2008, 2010	9 miles	Unknown
Johnson Wash-1	UT15010003-004_00	Johnson Wash and tributaries from Utah-Arizona state line to Skutumpah Canyon confluence	Total Dissolved Solids	2008, 2010	1.5 acres	Agriculture

Sources: BLM GIS 2014a; EPA 2012

Various public organizations and government entities conduct measures to control woody invasive plants. This work, principally on Russian olive, has been conducted in the Escalante watershed. In addition, tamarisk has been removed. Woody invasive plants are removed through passive or active revegetation with native species; this provides nonpoint source reduction through both bank stabilization and restoration/enhancement of the riparian community and associated hydrologic, sediment trapping, and biogeochemical processes (Utah Department of Environmental Quality 2013 and Woody Invasive Control Committee 2010).

Rangeland Health Standards

The BLM Utah developed Standards for Rangeland Health and Guidelines for Grazing Management in accordance with 43 CFR, Part 4180 to provide for conformance with the

Fundamentals of Rangeland Health. Through conformance and attainment of Utah's Standards and Guidelines, BLM Utah ensures that the Fundamentals of Rangeland Health are met. According to Standard 4, the BLM Utah and GSENM will apply and comply with water quality standards established by the State of Utah (R.3172) and the Federal Clean Water and Safe Drinking Water Acts (BLM 1997). See Section 2.1 for Standard 4 indicators.

The BLM coordinates monitoring water quality activities with other federal, state, and technical agencies. Livestock grazing allotments in the decision area that do not meet Standard 4 due to livestock grazing are Rock Creek-Mudholes and Vermilion. Grazing was a contributing factor but not the sole causal factor, for Standard 4 not being met in the Headwaters, Last Chance, and Nipple Bench allotments. Standard 4 was not met for the Cottonwood, Coyote, Fortymile Ridge, and Upper Paria allotments, but this was due to factors other than livestock grazing (BLM 2006).

There are three additional allotments in the decision area that did not meet Standard 4 due to natural conditions and geology. Because the factors for not meeting Standard 4 are not issues that the BLM can resolve through management, the allotments were considered to meet rangeland health standards. Those allotments are Deer Springs Point, Wahweap, and Wiregrass (BLM 2006). The criteria and water sources assessed for 303(d) listing and Standard 4 are not necessarily identical.

Range Improvements Involving Water

There are two types of range improvements: nonstructural and structural (BLM 2014c). Seedings or prescribed burns are examples of nonstructural range improvements. Fences or facilities, such as wells or water pipelines, are examples of structural improvements. Structural range improvements involving water in the decision area include dams/reservoirs, earthen check dams, detention dams, retention dams, erosion control dams, dikes/diversions, guzzlers, storage tanks, wells, improved and developed springs, troughs, rain gauges, water sources, and pipelines. Many structural improvements are considered permanent.

Flash Floods

A flash flood is a rapid rise of water (generally within six hours) along a stream or low-lying area after a heavy rainfall or from the failure of a dam, levee, or ice jam. Flash floods occur in the planning area, such as in canyons and washes. The National Weather Service Salt Lake City office produces a product called the Flash Flood Potential Rating for areas such as Glen Canyon and GSENM that is issued twice daily during the summer and fall seasons, approximately mid-May to late October (National Oceanic and Atmospheric Administration 2013). The Flash Flood Potential Rating provides a rating for the potential for flash flooding over the next two days.

Flash floods can affect livestock grazing and water resources. They can damage fences or water-related range improvements, and increase the potential for erosion by stripping vegetation and other soil stabilizing agents from the landscape. This is more likely to occur where vegetation has already been degraded. They can also alter drainage patterns and deposit unusually high volumes of sediment or pollutants in water resources. The longevity of impacts from flash floods varies depending on a variety of factors, including the location, intensity, and duration of the flash flood, the integrity of land surface conditions prior to the flash flood, and the type and location of structures.

Trends

Total dissolved solids are a water quality problem in GSENM. This is due to erosion and the composition of the local geology. Temperature, total phosphorus, and benthic macroinvertebrate bioassessments are also water quality problems. Based on limited data, these water quality problems are believed to be consistent and are not worsening.

Section 319 funding is awarded each year to the State of Utah through a grant from the EPA in accordance with Section 319 of the Clean Water Act. Section 319(h) funds are distributed at the local level to help address water quality issues resulting from nonpoint source pollution. In 2012, Utah BLM continued to implement a Healthy Lands and Watershed Restoration program, focused on improving habitat, vegetation, and improving water quality by reducing erosion from BLM-managed lands. These efforts included many watershed improvement projects that will contribute to improved land health and long-term reduction of erosion and sediment loading, which will also reduce total dissolved solids (salinity). GSENM efforts included the Escalante River Watershed Partnership, which involved woody invasive control, restoration, and inventory projects. Woody invasive control also occurred in Glen Canyon. GSENM efforts also included watershed improvement projects and riparian projects. Glen Canyon efforts included water quality monitoring, grazing management, dreissenid mussel prevention, riparian restoration, and special projects related to OHVs, Lake Powell, bonytail chub reintroduction, and bank erosion on the Colorado River (Utah Department of Environmental Quality 2013).

For the Colorado Plateau ecoregion, creeks, streams, and rivers have experienced diminished in-stream flow and altered flow regimes created by dams, channelization, canal systems, and water diversions (Bryce et al. 2012). River flow regulation, channelization, levees, and dikes have eliminated spring flooding in some cases.

New diversions and water rights occur occasionally. Although water uses are relatively static, use of Wide Hollow Reservoir has increased slightly, and Henrieville water use has also increased. Livestock water uses have remained fairly static.

Since 2006, the BLM, in coordination with permittees, has made changes in the Vermilion and Rock Creek-Mudholes allotments, which failed to meet Standard 4 due to livestock grazing. Such changes include voluntary nonuse, removing feral cattle, maintenance or installation of spring and pasture fencing, and new water developments. As a result of these changes, areas that did not meet standards are now making progress toward doing so, based on recent PFC assessments. See Table 2-4, Allotments Not Meeting Rangeland Health Standards Due to Livestock Grazing in 2006, for more information.

Utah's weather is prone to extremes, from severe flooding to multiyear droughts (Wilkowske et al. 2003). Five major floods occurred during 1952, 1965, 1966, 1983, and 1984, and six multiyear droughts occurred during 1896-1905, 1930-36, 1953-65, 1974-78, 1988-93, and 1999-2002. During 2002, some areas of Utah experienced record-low stream flows. The areal extent of floods is generally limited in size from one to several watersheds. Droughts generally affect most or all of the state.

The BLM issued IM 2013-094, Resource Management During Drought, to provide general guidance regarding BLM program management in the face of drought. It also provides specific

livestock grazing program guidance. Although this guidance is centered on the biological resource programs that have direct impacts on the long-term health of rangelands, the communication and coordination principles apply to many other resource programs as well. The procedures outlined in the IM provide guidelines for line managers regarding their approach to formulating and implementing actions to mitigate the effects of BLM authorized uses on drought-stressed resources. Not all procedures will be applicable to all situations and where necessary, these may be adapted or modified to suit local circumstances. This policy is supplemental to standard BLM program procedures and is intended to be used as a tool to help address and mitigate the impacts of drought (IM 2013-094).

Forecast

The BLM is beginning to make changes to its water quality monitoring plan to ensure there are enough monitoring sites and sufficient data for 303(d) streams in order to identify ways to improve water quality management. The BLM is also working to compile more comprehensive information through monitoring of other aquatic resources.

For the decision area, the BLM assumes populations in nearby communities will remain constant or increase. Increasing populations are expected to place greater demands on recreation opportunities in GSENM and Glen Canyon. Therefore, demand for water supplies to support the public and water-based recreation activities would experience a corresponding increase. New diversions and water rights are anticipated to occur occasionally. Use of Escalante Reservoir is anticipated to increase, and Henrieville water use is also anticipated to increase. Livestock water uses is anticipated to remain fairly static.

There is unallocated water outside of GSENM. There has been some development in areas around Escalante to Boulder, which will increase water use.

The number of allotments failing to meet Standard 4 due to livestock grazing is expected to decrease or remain the same. Improvements in riparian areas, such as fencing out livestock and providing alternate water sources, are expected to improve previous water-related problems. This would decrease the number of allotments not meeting Standard 4 (or at least, the number would remain the same).

Key Features

Key water resource features that guide land use allocation or management decisions involve surface and groundwater. Surface water may be ephemeral, intermittent, or perennial. With respect to livestock grazing, surface water involves streams, springs, ponds, and lakes. It also involves riparian areas and wetlands, which are discussed in Section 2.2. With respect to livestock grazing, groundwater involves aquifers that discharge to surface water and wells. Water sources are identified as one of the Monument objects in the Proclamation (see Section 5.4, GSENM Proclamation and Objects).

Data Gaps

There are inventory gaps in the characterization of water sources, such as springs. Also, there are few stream gages in GSENM and Glen Canyon. Stream gages are used to monitor streams. They provide information about, for example, stream flow and volume. It is important to better understand groundwater-surface water interactions because many of the surface water sources

are groundwater dependent, including springs and most, if not all, streams. Fundamental information on stream flow is an important component of water management and is presently very limited. Without understanding the magnitude and daily/seasonal/inter-annual variation in stream flow, it is difficult to manage all water uses and to ensure adequate protection of all aquatic resources.

2.4 SOIL

Regional Context

The planning area is within the Colorado Plateau ecoregion, which is in portions of Utah, Colorado, New Mexico, and Arizona. The Colorado Plateau REA (Bryce et al. 2012) describes the ecoregion. The ecoregion is an erosional landscape with wind and water working on layers of sedimentary rock. Soils of the ecoregion are relatively undeveloped, having formed in residuum from sedimentary rocks weathering-in-place. Across the ecoregion, the pattern of vegetative cover reflects the variability in geology, physiography, elevation, aspect, ground and surface water availability, and soil (texture, depth, and water-holding capacity).

Geologic and climatic features of Colorado Plateau drylands have produced weakly developed soils (Miller 2005). The physical and chemical characteristics of the soils closely match the shales, sandstones, limestones, and igneous materials from which they were derived. Geomorphic processes, such as erosion and deposition, have built upon this to generate abrupt or gradational juxtapositions of landforms and soils differentiated based on soil depth, particle size distributions, mineralogy, and degree of profile development. Effects of human activities and aeolian dust inputs also influence soil characteristics. Additionally, wind can have important effects on the structure and functioning of dryland ecosystems. Wind strongly affects evapotranspiration rates and, therefore, can modify the energy and water balances of plants and soils. Similar to water, wind is an important force driving the redistribution of soil resources both within and among ecosystems.

Semi-arid and arid landscapes with sparse vegetation and biological soil crust cover lack redundancy in function (Bryce et al. 2012). In other words, when crust is eliminated, so too are the essential functions it provides: nitrogen fixation, carbon storage, the capture of dust and airborne nutrients, moisture retention, and the provision of microsites for native plant germination.

Soils in arid and semiarid regions are particularly critical to sustaining ecosystems because they are more vulnerable to degradation from a number of natural and artificially induced disturbances. Management practices may affect the ability of the various soils to maintain productivity by influencing such disturbances as displacement, compaction, erosion, alteration of organic matter, and soil organism levels. When soil degrades in semiarid regions, natural processes are slow to restore site productivity. Soil bulk density (mass per unit volume), porosity, organic matter content, hydraulic conductivity, moisture content, nutrient content, and soil temperature are affected to various degrees by surface disturbance. In turn, these factors affect soil-water interactions, productivity, nutrient cycling, water holding capacity, and soil erosion rates.

Indicators

Indicators of the condition of soil resources are the following:

1. Soil health, specifically the ability of soils to support vegetation and biological soil crusts representative of particular ecological site (e.g., vegetation type, diversity, density, and vigor)
2. Soil vulnerability to impacts (i.e., fragile or sensitive soils; Bryce et al. 2012, Section 4.1.3.1)
3. BLM Utah's Standards for Rangeland Health and Guidelines for Grazing Management
4. Land disturbance

Current Condition

Soil Characteristics

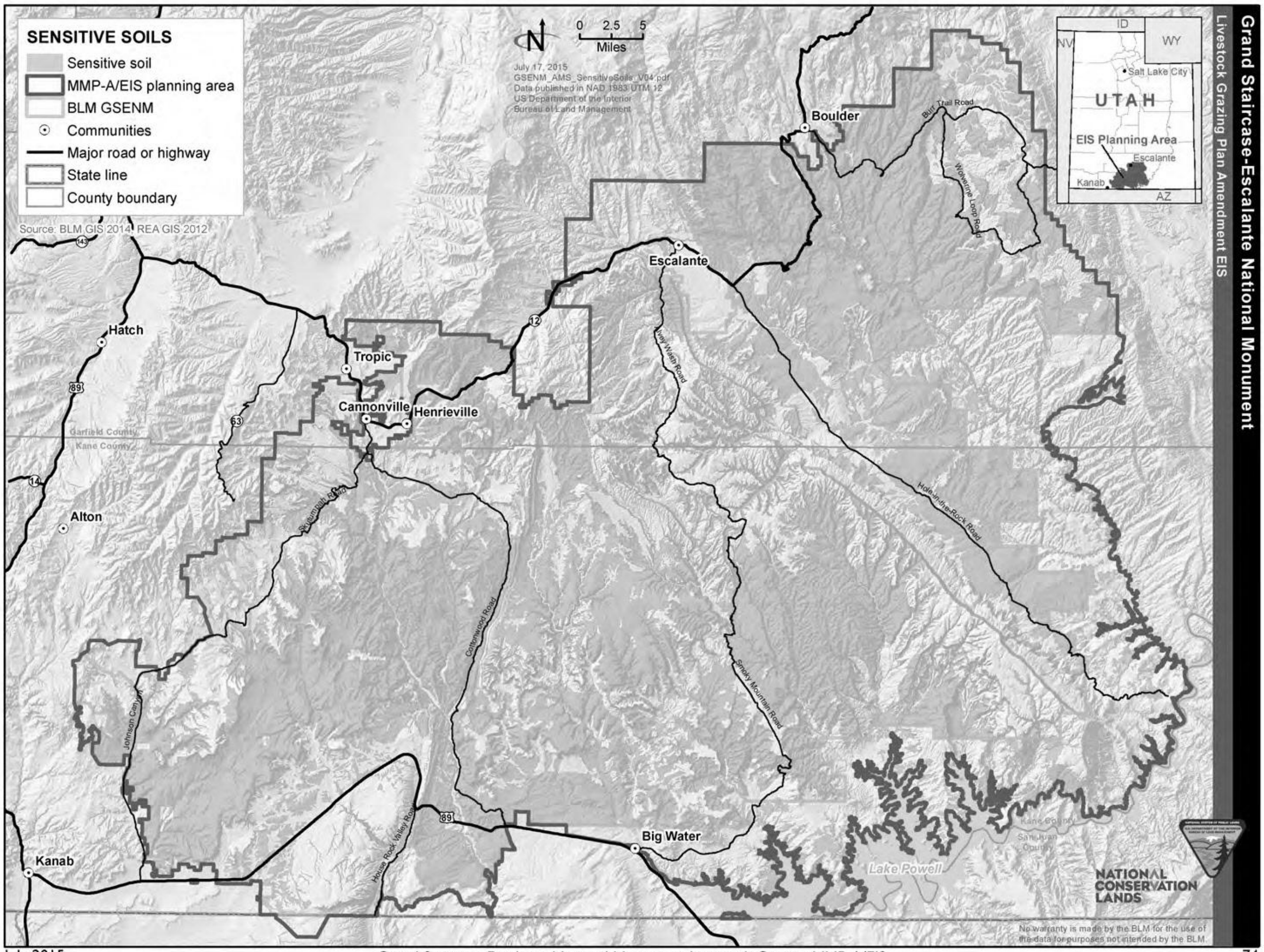
Most of the soils in the planning area are semiarid, young, and poorly developed. Chemical and biological soil development processes, such as rock weathering, decomposition of plant materials, accumulation of organic matter, and nutrient cycling, proceed slowly in this environment. In many areas, natural or geologic erosion rates are too fast to develop distinct, deep soil horizons. Most soils are less than 0.5 meter deep to bedrock. The deeper soils are formed in recent alluvium. Almost all of the local soils are derived from sedimentary rock. The dominant topographic features are structural benches, mesas, valley floors, valley plains, alluvial fans, stream terraces, hills, cuestas, and mountainsides. The NRCS has completed soil surveys for the BLM and NPS in GSENM and Glen Canyon (NRCS 2007, 2010).

Dominant soil orders in the decision area are aridisols (desert soil), entisols, and mollisols. Aridisols are dry soils that have low organic content. They are sparsely vegetated by drought- or salt-tolerant plants and, therefore, erosion is severe both by wind and water. Entisols are soils that have little development, and most are basically unaltered from their parent material. Many different parent materials contribute to varied soil properties of entisols, and they are often found in very dry or cool locations. Mollisols form in semi-arid to semi-humid areas and are characterized by a significant accumulation of humus in the surface horizon. These mineral soils are typically under native grass vegetation and are highly arable. In the decision area, approximately 828,300 acres are aridisols, 1,410,400 acres are entisols, and 14,900 acres are mollisols (BLM GIS 2014a). In general, mollisols are more capable of forage production than aridisols and entisols.

Sensitive Soil

Soils that have characteristics that make them extremely susceptible to impacts and difficult to restore or reclaim are considered sensitive soils. Figure 2-4, Sensitive Soils, is from the REA (Bryce et al. 2012) and shows all classes of sensitive soils, including droughty (marked by little or no precipitation or humidity), shallow, hydric (soils permanently or seasonally saturated by water), gypsiferous (soils containing sufficient quantities of gypsum [calcium sulphate] to interfere with plant growth), salty, and high calcium carbonate (calcareous). The REA does not include data for all sensitive soils in the ecoregion.

Figure 2-4


SENSITIVE SOILS
Sensitive soil
MMP-A/EIS planning area
BLM GSENM
Communities
Major road or highway
State line
County boundary
Source: BLM GIS 2014, REA GIS 2012
N
0 2.5 5
Miles
Grand Staircase-Escalante National Monument
Livestock Grazing Plan Amendment EIS
UTAH
Salt Lake City
EIS Planning Area
Escalante
Kanab
ID
WY
NV
AZ
Boulder
Escalante
Hatch
Tropic
Cannonville
Henrieville
Alton
Kanab
Big Water
Lake Powell
Garfield County
Kane County
Burr Trail Road
Wolverine Loop Road
Hole-in-the-Rock Road
Cottonwood Road
Smoky Mountain Road
Johnson Canyon
House Rock Valley Road
NATIONAL CONSERVATION LANDS

Biological Soil Crust

Technical Reference 1730-2, Biological Soil Crusts: Ecology and Management, contains a description of biological soil crust distribution and factors influencing species composition, ecological roles, response to natural and human actions, management techniques, and monitoring methods (US Department of the Interior 2001). It also explains various ecological roles of biological soil crusts.

Biological soils crusts are comprised of cyanobacteria, fungi, and lichen growing in a symbiotic relationship on the soil surface (Bryce et al. 2012). Soil crusts serve as intermediaries between soil and vegetation. Crusts on fine-textured soils often appear dark, rough, and pinnacled. Those on sand usually do not develop pinnacles and instead appear as a dark, two-dimensional layer on the surface.

Biological soil crusts aggregate surface soil and regulate the water runoff-infiltration balance (Bowker et al. 2006). Crust organisms enhance the nutrient status of soils via nitrogen fixation, carbon fixation, entrapment of aeolian silts and clays, and chelation of metals, all of which affect vascular plant performance. Disturbance due to livestock grazing is the most widespread stressor of crust communities throughout their range. Depending on livestock grazing intensity, livestock disturbance of soil crusts generally results in a reduction of lichen and moss components, diminishing ecosystem functions, and services provided by crusts. Estimates of recovery time from such disturbances are usually measured in decades.

Biological soil crusts are an important component of ecosystems in semiarid areas and may represent up to 70 percent of the living cover (Belnap 1995, p. 179). Research has shown that biological soil crusts provide important contributions to soil stabilization, hydrologic processes, nutrient cycling, and biological diversity in rangeland ecosystems (Miller 2008, p. 251). Biological soil crusts have a stronger direct effect on surface soil stability than plants or mycorrhizal fungi (Chaudhary et al. 2009, p. 116). Biological soil crusts are susceptible to damage by compression caused by grazing or off-road driving and can be negatively affected by fire. Researchers have developed models to facilitate the comparison between actual and potential cover and composition of biological soil crusts. This is so that sites in poor condition can be identified and management changes can be implemented (Miller 2008, p. 251; Bowker et al. 2006, p. 519).

Due to the importance of biological soil crusts in rangeland health, biological soil crust integrity was also assessed in the planning area (Miller 2008). Quantitative data on biological soil crust composition, abundance, and distribution were compared to reference areas; ratings were informed by preliminary results from a concurrent project to develop a spatial predictive model of biological soil crust cover in GSENM (Bowker et al. 2006). The study found that fine-loamy soils associated with the semidesert loam ecological site had high potential to support biological soil crust development (Miller 2008, p. 259). This ecological site corresponds to the Wyoming Big Sagebrush, Saltbush, Blackbrush, Spiny Hopsage, Black Sagebrush, Torrey's Jointfir, Utah Juniper – James Galleta, and Utah Juniper-Pinyon sites shown in Figure 2-2, Dominant Ecological Site Descriptions – Vegetation Type. Given the sensitivity of soils and high biological soil crust potential of these sites, and the importance that biological soil crusts play in soil stabilization and other rangeland health factors, the functional significance for biological soil crusts in these sites is particularly high (Miller 2008, p. 259).

Soil crusts are useful ecological indicators of desert condition because they are not only sensitive to disturbance but they respond to disturbances in predictable and quantifiable ways (Bryce et al. 2012). Maps of potential crust abundance indicate the *potential* quantitative cover of biological crusts and major crust constituents (mosses, lichens, dark cyanobacterial crusts) across the Colorado Plateau (Figures 2-5, Potential Early Successional Soil Crust, and 2-6, Potential Late Successional Soil Crust). Comparisons of observed crust distribution with potential distribution can serve as a surrogate for reference condition.

Soil crusts may take decades to recover from disturbance. Therefore, they are not good short-term indicators of the appropriateness of current management actions.

Rangeland Health Standards

Utah's Standards for Rangeland Health and Guidelines for Grazing Management were developed in accordance with 43 CFR, Part 4180 to provide for conformance with the Fundamentals of Rangeland Health. Through conformance and attainment of Utah's Standards and Guidelines, Utah BLM assures that the Fundamentals of Rangeland Health are met. According to Standard 1, upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform (see Section 2.1 for Standard 1 indicators).

There are six livestock grazing allotments in the decision area that do not meet Standard 1, and livestock grazing was determined to be the causal factor for not meeting on all six allotments. The six allotments are: Circle Cliffs, Coyote, Mollies Nipple, Soda, Upper Paria, and Vermilion (BLM 2006). To address issues related to Standard 1, the BLM recommended a variety of changes to grazing management specific to each allotment, including suspension of use, deferred rotation grazing systems, alternating seasons of use, adjusting season of use, restoration, subdivision of pastures, new water sources, and adjustments to authorized use during drought periods.

Land Disturbance

The primary sources of land disturbances in GSENM and Glen Canyon are from livestock grazing and recreation. Livestock grazing and recreation are discussed in Sections 2.1 and 2.5, respectively.

Trends

Persistent wind and both wind and water erosion of soil are natural phenomena in desert ecosystems. However, human activities, including past mining, recreation, and grazing, all disturb the soil surface, affecting protective crusts and vascular plants and exposing underlying soils to wind and water erosion (Bryce et al. 2012).

Six allotments did not meet Standard 1 in the 2006 Rangeland Health Determinations. Since 2006, the BLM, in coordination with permittees, has made changes in the Circle Cliffs, Coyote, Mollies Nipple, Soda, Upper Paria, and Vermilion allotments, which failed to meet Standard 1 due to livestock grazing. Such changes include seeding restoration, restricting season of use, maintenance of range improvements, voluntary nonuse, and removal of feral cattle. As a result of these changes, many areas that did not meet standards are now making progress toward doing so, based on recent upland assessments. See Table 2-4, Allotments Not Meeting Rangeland Health Standards Due to Livestock Grazing in 2006, for more information.

Figure 2-5

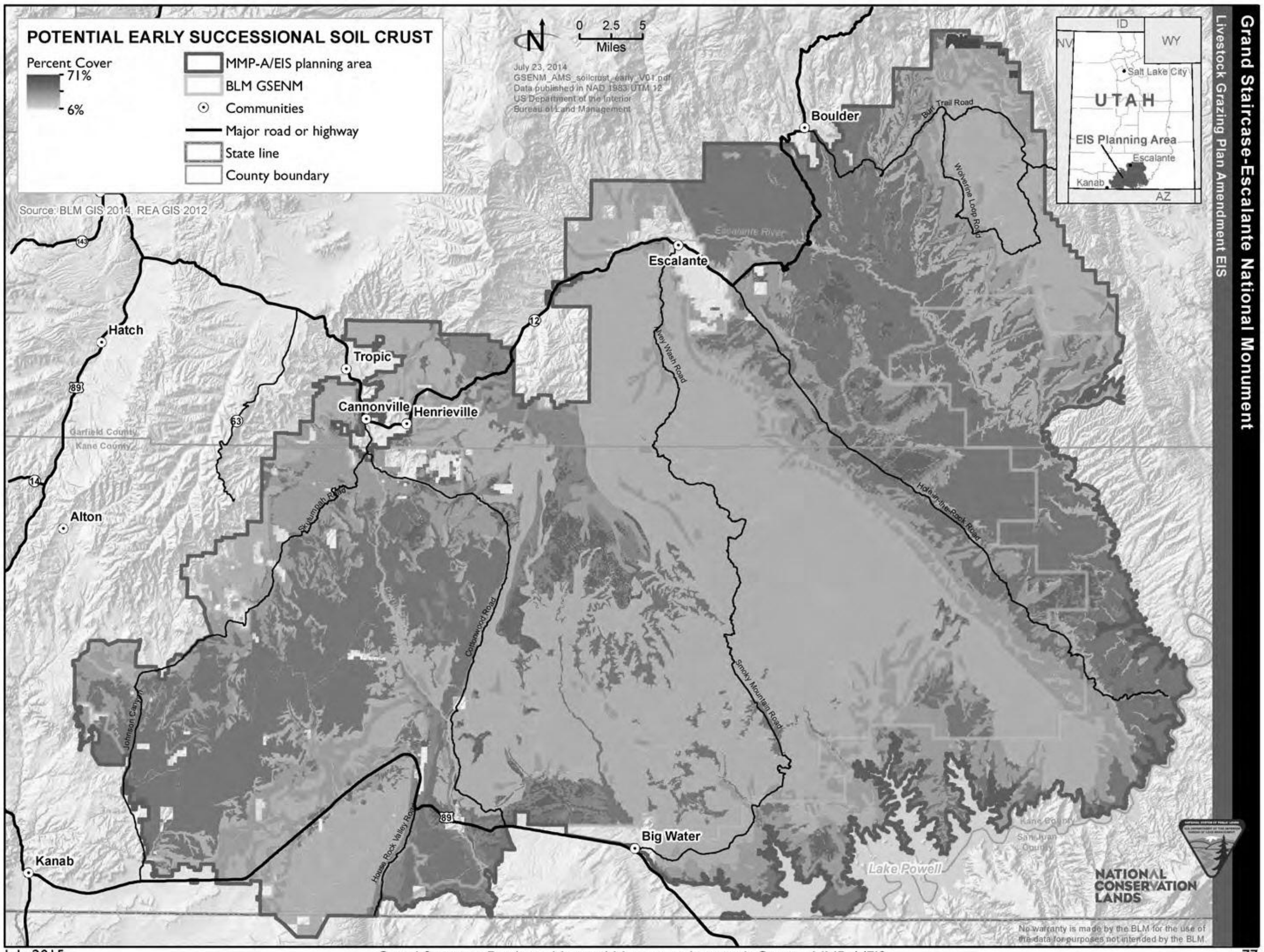
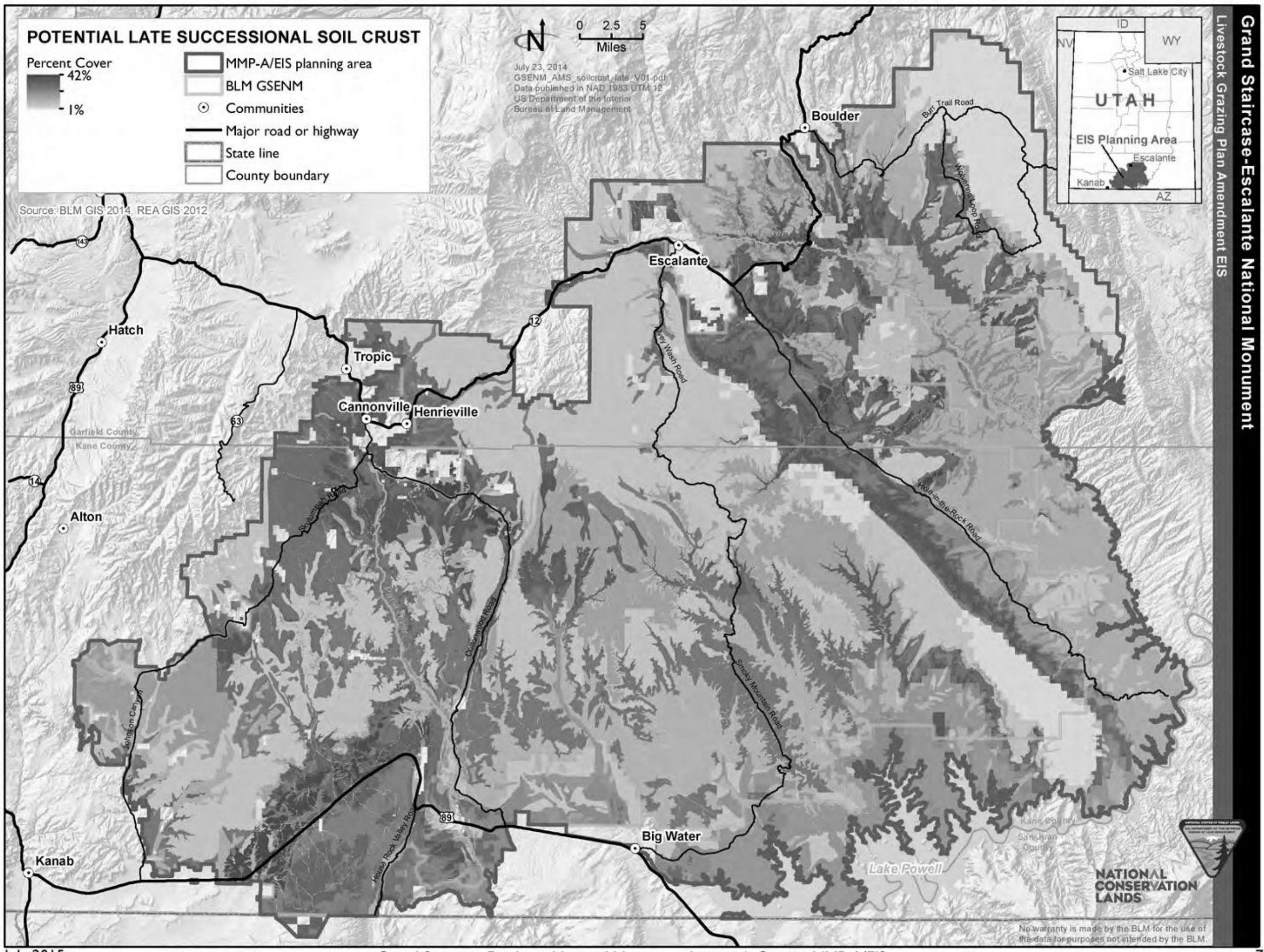

POTENTIAL EARLY SUCCESSIONAL SOIL CRUST
Percent Cover
71%
6%
MMP-A/EIS planning area
BLM GSENM
Communities
Major road or highway
State line
County boundary
Source: BLM GIS 2014, REA GIS 2012
N
0 2.5 5
Miles
Grand Staircase-Escalante National Monument
Livestock Grazing Plan Amendment EIS
UTAH
Salt Lake City
EIS Planning Area
Escalante
Kanab
ID
WY
NV
AZ
Boulder
Escalante
Hatch
Tropic
Cannonville
Henrieville
Alton
Kanab
Big Water
Lake Powell
NATIONAL CONSERVATION LANDS

Figure 2-6


POTENTIAL LATE SUCCESSIONAL SOIL CRUST
Percent Cover
42%
1%
MMP-A/EIS planning area
BLM GSENM
Communities
Major road or highway
State line
County boundary
Source: BLM GIS 2014, REA GIS 2012
Miles
0 2.5 5
Grand Staircase-Escalante National Monument
Livestock Grazing Plan Amendment EIS
UTAH
Salt Lake City
EIS Planning Area
Escalante
Kanab
ID
WY
NV
AZ
Boulder
Escalante
Tropic
Cannonville
Henrieville
Hatch
Alton
Kanab
Big Water
Lake Powell
NATIONAL CONSERVATION LANDS

As mentioned in *Vegetation Trends* in Section 2.2, issues identified in rangeland health assessments in sagebrush grassland seedings were a reduction in biological soil crust, a shift in functional/structural groups, increased soil erosion, and bare ground (BLM 2006).

Forecast

The BLM expects human activities to continue to disturb the soil surface, thereby affecting soil crusts, and exposing underlying soils to wind and water erosion.

Key Features

According to the REA, biological soil crust is a key conservation element (Bryce et al. 2012). Biological soil crusts are also identified as a Monument object, along with unusual and diverse soils (see Section 5.4, GSENM Proclamation and Objects).

Data Gaps

Soil crusts have not been inventoried across the entirety of the Monument. However, the BLM does have a predictive model of soil crust developed from the NRCS soil survey (Bowker et al. 2006). The BLM also has site-specific information related to soil crust.

2.5 Recreation

Recreation is a major and growing use of BLM- and NPS-managed lands within the planning area. The planning area's unique geologic, historic, and scenic features create a desirable setting for outdoor recreational enthusiasts. The types of recreation in the planning area include camping, fishing, hiking, backpacking, hunting, mountain biking, kayaking, OHV use, and driving for pleasure. Other popular recreation destinations in the region are Grand Canyon, Zion, Bryce Canyon, and Capitol Reef National Parks, and the Dixie National Forest. Proximity to these areas allows visitors to access GSENM and Glen Canyon.

The increasing popularity of the planning area's unique waterways and other areas for motorized, mechanized, equestrian, and nonmotorized recreation raises the potential for conflict with ongoing livestock grazing practices; at the same time, it presents challenges for the continued use of the area for livestock grazing. A conflict between recreation and grazing results from any real or perceived reduction in the viability, efficiency, and safety of either or both uses.

Recreation users report such conflicts as degraded stream channels and underlying or adjacent trails, dust from livestock herding, and livestock droppings or carcasses obstructing recreation. Recreation users also report conflicts with livestock grazing due to vegetation and soil crust damage and soil trampling, predator control activities (trapping and poisoning), livestock odors, biting flies, safety concerns with cattle on roadways, damage to road infrastructure, and degraded wildlife habitat.

At the same time, recreation users can disrupt grazing, for example, by leaving gates open or causing livestock to move into slot canyons. Impacts on grazing from recreation can subsequently intensify or expand impacts on recreation from grazing. While the frequency and intensity of conflicts is greatest in high-use recreation areas, such as the Gulch, Buckskin Gulch, and the Paria-Hackberry area, where grazing also occurs, the concurrent use of an area for both uses does not automatically result in a conflict. In some cases, the presence of livestock may augment a recreation user's experience. Particularly for recreation users knowledgeable about

livestock use in GSENM, there is an understanding that livestock grazing is an aspect of tourism and recreation in GSENM. Increasing education could therefore alleviate future conflicts.

Current Condition

GSENM

There are four management zones within GSENM (see Figure 2-7, Recreation). These zones reflect the location, type of recreational setting, and subsequent opportunities likely to be available to users within GSENM. Each zone's geographic boundary is defined by factors such as the accessibility to and movement within the area via existing roads or trails, sensitive habitats, terrain, and special management area designation boundaries. The four management zones in GSENM consist of the following:

1. The Frontcountry Zone (78,100 acres or 4 percent of GSENM) is intended to be the focal point for visitation by providing day-use opportunities in close proximity to adjacent communities and to Highways 12 and 89, which traverse GSENM. This zone will accommodate the primary interpretation sites, overlooks, trails, and associated facilities necessary to feature GSENM resources. The zone boundaries were developed by locating a corridor along Highways 12 and 89, Johnson Canyon Road, and the portion of Cottonwood Canyon Road leading to Grosvenor Arch. The zone was then expanded or constricted to coincide with the dominant terrain features, which provide identifiable boundaries on the ground. Existing destinations such as Grosvenor Arch, the Pahria townsite, and the Calf Creek Recreation Area were included in order to provide for necessary improvements and to accommodate expected visitation. Lands close to the Town of Escalante were also included due to extensive visitor use. In delineating this zone, wilderness study areas, threatened and endangered species habitat, relict plant areas, riparian areas, and other sensitive resources were avoided wherever possible. Highway 89, from the western boundary to The Cockscomb, lacks dominant terrain to delineate this zone. For this reason, a 1-mile buffer along each side of the highway was used.
2. The Passage Zone (39,000 acres, or 2 percent of GSENM) includes secondary travel routes that receive use as throughways and recreation destinations. While rudimentary facilities necessary for safety, visitor interpretation, and for the protection of resources will be allowed in this zone, the BLM will generally avoid directing or encouraging further increases in visitation due to the condition of routes and distance from communities. The primary criterion for developing the zone boundaries was again dominant terrain. The boundary does not constrict closer than 100 feet to designated routes, and encompasses most obvious imprints of human activities such as trailheads, transmission rights-of-way, and potential resource interpretation sites within 0.5 mile of the subject route. In many cases, dominant terrain was not available along route segments. In these cases, a 660-foot buffer was used. Again, wilderness study areas, threatened and endangered species habitat, relict plant areas, riparian areas, and other sensitive resources were avoided wherever possible.

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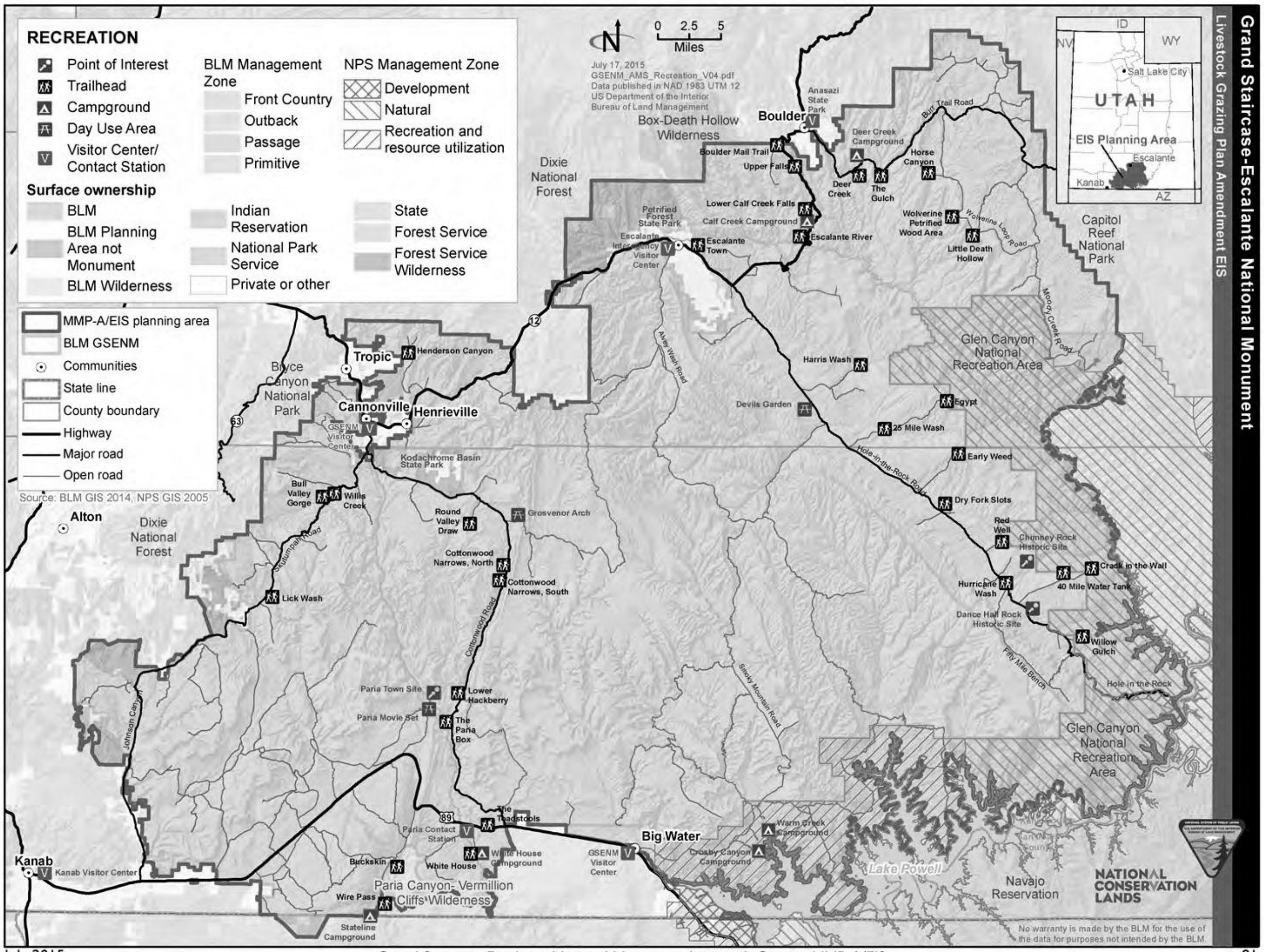
Figure 2-7



DOI-2019-08 01302

3. The Outback Zone (537,700 acres or 29 percent of GSENM) is intended to provide an undeveloped, primitive and self-directed visitor experience while accommodating motorized and mechanized access on designated routes. Facilities will be rare and provided only when essential for resource protection. The remaining public routes not in the Frontcountry or Passage Zones are included in the Outback Zone. Dominant terrain was again a primary criterion for the zone boundary. The boundary does not constrict closer than 100 feet to the routes. Wilderness study areas were avoided wherever possible.
4. The Primitive Zone (1,210,600 acres or 65 percent of GSENM) is intended to provide an undeveloped, primitive and self-directed visitor experience without motorized or mechanized access. Some administrative routes are included in this zone, which could allow very limited motorized access. Facilities will be nonexistent, except for limited signs for resource protection or public safety. The zone is intended to facilitate landscape-scale research and therefore connects each of the three major landscapes (Escalante Canyons, Kaiparowits Plateau, and Grand Staircase), as well as linking low elevation areas to higher elevations. This zone is also intended to connect primitive and undeveloped areas on surrounding lands managed by other federal agencies (BLM 2000).

The BLM manages six special recreation management areas (SRMAs) in GSENM (Figure 2-8, Special Recreation Management Areas and Wilderness Study Areas). Compared to areas outside SRMAs, BLM management within SRMAs emphasizes the maintenance and enhancement of recreation users' experiences through the preservation of a unique setting and provision of recreational facilities and other features to promote that experience. Within SRMAs, management actions may be necessary to reduce user conflicts and maintain users' safety, while maintaining the quality of the areas' natural resources. Management prescriptions for the six SRMAs in GSENM are as follows (BLM 2000):

1. *SRMA-2 Escalante Canyons SRMA*—The boundary of this SRMA will follow the geographical topography, including all the tributaries to the main Escalante Canyon. It will include trailheads for all the popular routes into the canyons. Activities in this SRMA include backpacking, canyoneering, nonmotorized boating, and equestrian use. The overall recreation experience will continue to be primitive, uncrowded, and remote. Overall, social encounters will remain low compared to other southwest canyon hiking opportunities. However, a range of social encounters will be available. Potential permit systems could address general public, commercial, and administrative users.
2. *SRMA-3 Paria/Hackberry SRMA*—This area is bordered on the west by Kitchen Canyon Road, on the east by Cottonwood Canyon Road corridor, on the south by the confluence of Hackberry/Cottonwood Creeks and the Paria River, and on the north by Dixie National Forest, excluding the Skutumpah corridor. Activities in this SRMA are backpacking, canyoneering, and equestrian use. The overall recreation experience will continue to be primitive, uncrowded, and remote. Equestrian opportunities will be emphasized in Paria Canyon, while backpacking opportunities

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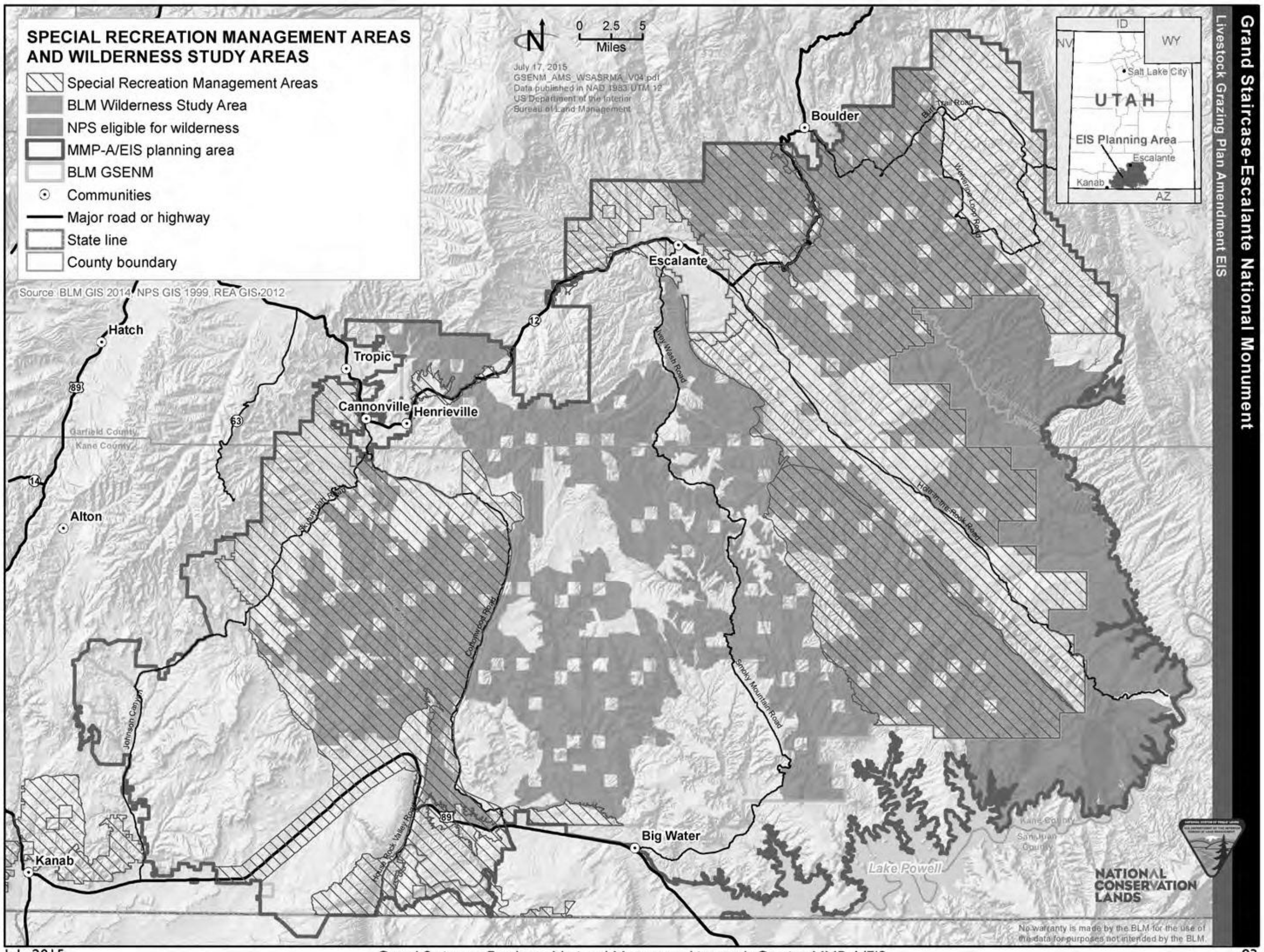
Figure 2-8



DOI-2019-08 01304

will be emphasized in Hackberry Canyon. Potential permit systems could address general public use and commercial users.

3. *SRMA-4 Paria Canyon and Plateaus SRMA*—This area encompasses Buckskin Mountain, West Clark Bench, and Cedar Mountain to connect to the BLM Arizona Strip's "Canyons and Plateaus of the Paria Resource Conservation Area." These areas are located south of Highway 89, with the Monument boundary marking the east boundary. Activities in this SRMA include canyoneering, equestrian use, backpacking, hiking, hunting, and scenic touring along the House Rock Valley Road. The overall recreation experience will continue to be primitive, uncrowded, and remote. Overall social encounters will remain low compared to other southwest canyon hiking opportunities. However, a range of social encounters occur. Management of this SRMA will be in coordination with the Kanab and the Arizona Strip Field Offices.
4. *SRMA-5 Fiftymile Mountain SRMA*—This areas [sic] includes the geographical area called Fiftymile Mountain including trail access points. Activities in this SRMA include equestrian use, backpacking, and hunting. The recreation experience will be primitive, uncrowded, and remote. Visitors will not be encouraged to go to this area and commercial outfitting will be extremely limited.
5. *SRMA-6 Highway 12 Corridor SRMA*—This area encompasses the Highway 12 corridor located in the Monument, including the Calf Creek Campground and Interpretive Trail. Activities in this SRMA include scenic driving, day-use hiking, camping, equestrian use, road bicycling, and scenic and interpretive viewing. The recreation experience will focus on learning about geology, history, archaeology, biology, and paleontology, in addition to scenic viewing. Short interpretive trails and scenic overlooks will be developed to encourage visitors to learn more about these Monument resources. Opportunities will accommodate all visitors. Information stations located in Boulder, Escalante, and Cannonville will disseminate educational materials to further information about these resources.
6. *SRMA-7 Highway 89 Corridor SRMA*—This area encompasses the Highway 89 corridor within the Monument, including the Paria Movie Set, the old Pahreah townsite, and the Paria Contact Station. Activities in this SRMA include scenic driving, day-use hiking, camping, road and mountain bicycling, and scenic and interpretive viewing. The recreation experience will focus on learning about geology, history, archaeology, biology, and paleontology, in addition to scenic viewing. Short interpretive trails and scenic overlooks will be developed to encourage visitors to learn more about these Monument resources. Opportunities will accommodate all visitors. This corridor will be coordinated with the Vermilion Cliffs Highway Project.

Within SRMAs, and to a lesser extent outside, BLM management seeks to minimize conflict with other uses and among different types of recreational users. In more remote areas in GSENM, user interactions are fewer as users disburse across the landscape. While interactions in these remote areas are fewer, the intensity of conflict can be higher. For example, if a backpacker seeking solitude encounters an off-highway vehicle user, the intensity of the conflict (i.e., the

disruption of the backpacker's desired setting and recreational experience) is greater than if the encounter occurred at the trailhead. In contrast, the off-highway vehicle user may not perceive any conflict.

Similarly, the potential for conflict with other uses occurs when the recreation user's desired setting and experience is altered by an unwanted activity. Potential conflicts among recreational and non-recreational users become a management concern when the conflict occurs frequently or at a high intensity. Interactions can occur frequently with lower perceptions of conflict on the part of the users if the interaction is expected. The intensity of a perceived conflict is higher where the interaction is not typical for the area and is therefore not expected, or where the interaction is expected, but higher than normal user volumes increase the proximity and frequency of the users' interactions thereby resulting in a conflict.

In 2013, Colorado Mesa University conducted the first phase of a five-year study to establish the recreation experience baseline for GSENM. Based on a focused analysis of the Hole in the Rock Road area, the study found that 22 percent of respondents identified livestock or evidence of them as a quality that diminishes the area's specialness. The largest contributors to diminished specialness, according to the study's respondents, were vandalism, overcrowding, lack of solitude, additional improvements, and damage to soils and vegetation (Colorado Mesa University 2014). The study demonstrates that respondents expect a strong sense of solitude and a desire for a natural landscape.

BLM-managed Land Outside GSENM

BLM-managed lands outside GSENM and Glen Canyon account for less than three percent of the planning area. The Kanab Field Office manages the majority of these areas (54,800 acres).

Of the total portion of the planning area in the Kanab Field Office, 42 percent (22,800 acres) are within the Escalante SRMA and another 11,200 acres (20 percent) are within the Paria Canyon SRMA, which includes the Canyon and Uplands Recreation Management Zones (BLM 2008b).

The Kanab RMP contains specific management objectives for each SRMA. In addition, for each SRMA, the RMP identifies the SRMA's recreation niche, primary recreation activities, and desired experiences.

For the Escalante SRMA, which is located northwest of the town of Escalante, the recreation niche is a town-accessible hiking and equestrian trail network offering views and varied terrain. Recreation objectives are to provide easy access to day-use recreational opportunities such as hiking, photography, equestrian use, OHV touring, rock climbing, and viewing scenery and wildlife. BLM management is intended to provide visitors with easy access to an outdoor setting with a mixture of social opportunities (e.g., at trailheads and at group events) and primitive experiences in the backcountry off trails.

In the Paria SRMA, located in the southwestern portion of the planning area, BLM manages for mostly backcountry wilderness recreational experiences in a combination of upland and unique slot canyon features. The recreation niche for the Canyon Recreation Management Zone consists of world-class wilderness trekking in deep slickrock slot canyons where visitors hike explore, backpack, and camp in or along colorful deep canyons, narrow slots, and cliffs. In the

Uplands Recreation Management Zone portion of the Paria SRMA, the recreation niche is world-class primitive and backcountry adventure recreation on and around the area's unique upland geologic features. BLM management objectives are to preserve the area's wilderness character while offering visitors the opportunity to hike, backpack, horseback ride, rock climb, and camp in the area. Recreation experiences are mostly primitive.

While neither the Kanab RMP Record of Decision nor the Final EIS specifically address the potential for recreation and grazing conflicts, designation and management of SRMAs emphasizes recreation management and is intended to minimize conflict with other uses. Management objectives for the Paria and Escalante SRMAs are to preserve backcountry recreation experiences. The Varney Griffin allotment, which covers much of the Escalante SRMA, is available for grazing but has not active grazing use.

Glen Canyon

Glen Canyon, managed by NPS, encompasses 318,900 acres in the southeastern portion of the planning area. The portion of Glen Canyon in the planning area accounts for one quarter of the 1,246,000 total acres in Glen Canyon. Established in 1972, one purpose of Glen Canyon is to provide for public enjoyment through diverse land- and water-based recreation opportunities; another is to protect scenic, scientific, natural, and cultural resources on Lake Powell, the Colorado River, its tributaries, and surrounding lands. In 2011, Glen Canyon received 2.2 million visitors (NPS 2014).

Glen Canyon is divided into four management zones: Recreation and Resource Utilization; Development; Cultural; and Natural Zones. Nearly all Glen Canyon lands in the planning area are within the Recreation and Resource Utilization and Natural Zones, with a small area along Hole in the Rock Road within the Development Zone.

Lands within the Recreation and Resource Utilization Zone consist of dry land and the lake's shoreline. NPS manages the zone to maintain natural processes and enhance fish and game populations. Consumption of renewable and nonrenewable resources is subject to the protection of park resources and values, including recreation.

The Natural Zone includes Glen Canyon's outstanding scenic resources, relatively undisturbed and remote areas, or areas bordering on places with established land-use practices that complement characteristics of the Natural Zone. NPS manages the Natural Zone to maintain isolated, natural processes. Consumption of renewable resources is subject to the protection of the recreational values of the area. The majority of the Natural Zone is proposed for designation as wilderness. Motorized travel is prohibited in the Natural Zone.

The NPS manages the Development Zone to provide visitor services and maintain facilities. This zone includes the permanent structures and operations necessary to support recreation activities and allows a wide range of recreational use.

The most popular activities in Glen Canyon and the reasons most people visit the area are sightseeing, motorized boating, swimming, and visiting the Glen Canyon visitor center. These recreational activities are most common in the spring and summer (NPS 2014).

Year-round paved or maintained gravel surface access to Glen Canyon from the north is limited to routes that pass through GSENM. Passenger vehicle access to Glen Canyon is available via Hole in the Rock Road, Cottonwood Road, Smoky Mountain Road, and Highway 89. Access to the portion of Glen Canyon in the Escalante Canyons area is available via Burr Trail, Wolverine Loop, and Mood Wash Roads, as well as by using primitive roads and trails that spur from Hole in the Rock Road. Motorized access in the Escalante Canyons area of Glen Canyon is prohibited.

Livestock grazing is an ongoing permitted use within portions of Glen Canyon. However, many of the allotments in Glen Canyon (e.g., Escalante River, Navajo Bench, Harvey's Fear, and portions of Rock Creek-Mudholes, Spencer's Bench, and Big Bown's Bench allotments) are closed.

Trends

GSENM

Recreation is a major use in GSENM, and the number of people taking part in recreational activities within GSENM has increased over the past decade and is expect to continue at a similar rate. In 2013, total visitation was 759,600, an increase of 35 percent since 2000, and the second highest number of yearly visitors since 1997 (BLM 2014d). GSENM receives visitors from across the US and internationally. In 2004, nearly 25 percent of all recorded visitors to the front country were from outside the US, while another 30 percent traveled from areas beyond the western US. Of the nearly 50 percent of visitors from the west, 14 percent were from Utah and another 13 percent from California. Demographically, visitors are a majority male (approximately 65 percent), older (average age of 50), first time visitors (60 percent), and visiting with just one other person (56 percent). Most visitors to the front country (87 percent) stay more than one day and stay 3.6 days on average (Utah State University 2004). While these numbers provide an indication of visitor use and activity trends, the BLM is neither able to record all visits to GSENM, nor identify the activities in which each visitor engages. As a result, it is challenging for the BLM to project how different demographic groups will engage with certain recreation activities in the future.

The BLM expects the most popular recreation activities in GSENM to continue to be pedestrian-based activities such as hiking, walking, backpacking, and photography. In 2013, the most popular trailhead for hiking and backpacking with nearly 25,000 visits was Lower Calf Creek Falls. The Calf Creek Recreation Area trailhead is easily accessed from Highway 12, near the Calf Creek Campground, and within a picturesque canyon feeding into the Escalante River; the nearby Upper Calf Creek trailhead received nearly 20,000 visits in 2013. Dry Fork Slots trailhead, located along Hole in the Rock Road, received approximately 20,000 users, Wire Pass trailhead near the Stateline Campground at the southern edge of GSENM received 15,000 visits, and the Toadstools trailhead located along Highway 89 near the White House Campground received approximately 8,000 users in 2013 (BLM 2013).

In a study conducted for the popular Hole in the Rock Road area, researchers asked survey participants to select the three recreational activities out of a list of 20 that they engage in most often while in the area. The researchers concluded that more than 70 percent of respondents engaged in hiking, walking, or running, 45 percent backpacked, and over 30 percent engaged in

photography. Another 24 percent engaged in scenic driving and 11 percent in OHV riding. Other recreation activities noted in the study include hunting, horseback riding, and picnicking. Approximately 10 percent of recreation users engage in each of these activities (Colorado Mesa University 2014). The BLM expects similar use in the future.

In the southwestern and northeastern portions of GSENM, as well as along the two major thoroughfares, Highways 12 and 89, motorized and mechanized recreation activities are and will likely continue to be popular. These areas provide opportunities for scenic driving and cycling.

The number of special recreation permits the BLM issues in GSENM fluctuates annually; however, the BLM anticipates a gradual increase over time. The BLM issued 90 special recreation permits for organized recreation activities in 2014, an increase of 15 percent since 2012, and the most since 2009 (BLM 2014d). The BLM issues special recreation permits for hiking tours, horseback and trail rides, outfitting and/or guiding for hunting, photography, vehicle tours, backpacking and camping, fishing, ATV tours, and outdoor education. Of the 78 special recreation permits issued in 2013, 24 were for hiking/backpacking, 15 for hunting, 14 for education/therapy, 11 for horseback riding, and 6 for vehicle tours (BLM 2014d).

While permitted uses take place year-round, most occur during the months other than winter. The Escalante Canyons SRMA in the northeastern portion of GSENM has the largest number of permit holders. These permit holders consist of local, regional, and national operators and guides. In 2011, half of the operators and guides were regional (i.e., those who travel two to eight hours to operate in GSENM). Another 38 percent were local (i.e., in the immediate area), while the remaining percentage traveled more than eight hours to operate in GSENM. Regional and national operators were from as far away as Minnesota, Michigan, and Alberta, Canada (BLM 2012). Between 2009 and 2013, total revenue from special recreation permits was $735,800 (BLM 2014d). Total revenue from special recreation permits is expected to remain steady or increase slightly.

Visitors who are involved with livestock grazing in GSENM identify recreational opportunities associated with livestock grazing. For example, visitors to GSENM are able to observe the cowboy and ranching lifestyle historic to the area. There are also limited opportunities for visitors to participate in cattle drives with operators in order to have a first-hand experience.

BLM-managed Land Outside GSENM

BLM-managed areas outside GSENM will continue to provide important recreational opportunities for the region's local population and visitors. Within the Paria and Escalante SRMAs, the BLM will continue to manage for unique scenic backcountry recreation experiences.

Glen Canyon

Visitation to Glen Canyon as a whole has steadily declined since a peak of 3.5 million visitors in 1992-1993. Total visitation fell below 2 million visitors from 2004 to 2009, but it has rebounded recently with approximately 2.2 million visitors in 2011 (NPS 2014). Despite an overall decline in visitor use to Glen Canyon, visitation in the planning area has increased over time as more visitors discover this area, particularly since the designation of GSENM. Escalante Canyons, the Colorado River, above and below Lake Powell, the Escalante River, and other tributaries attract visitors to areas in the Glen Canyon portion of the planning area.

Forecast

The BLM, in accordance with the FLPMA, the Presidential Proclamation 6920, and the MMP, manages GSENM for of the following purposes:

1. Protect GSENM objects (e.g., archaeological, historic, paleontological, geologic, and biological)
2. Establish a research and adaptive management program
3. Provide for visitor use in a manner consistent with the protection of GSENM objects

The MMP identifies livestock grazing and the accommodation of recreation by providing minor recreation facilities for visitors as primary management emphasis areas for the BLM.

The number of visitors entering the planning area to engage in recreation activities is expected to increase over time. The most notable increases are expected in popular recreation areas, such as Buckskin Gulch, Deer Creek area, Calf Creek area, and the Paria-Hackberry area in GSENM. As permit systems or facility sizes limit increased visitation in campgrounds and other popular areas, recreation users will venture elsewhere in the planning area.

With a continued rise in the number of recreational users within GSENM and Glen Canyon, the potential for conflict with ongoing grazing practices will likely increase. The potential for conflicts are greatest near water sources and in allotments that are also popular recreation areas. Recreation-grazing conflict areas include the Upper Hackberry allotment, near House Rock Valley Road and Paria Canyon, in areas surrounding the Deer Creek recreation site, The Gulch, Buckskin Gulch, and Horse Canyon. Perceived conflicts will occur throughout the planning area where recreation use and grazing coexist.

Additionally, because the unique waterways in the planning area contribute to the area's popularity as a recreation destination, degradation of these waterways resulting from grazing will continue to be viewed negatively by recreation users and will be a focal point of conflict. In the late summer and fall, when water is scarcer, recreation and grazing uses will concentrate on smaller areas of water. Any degradation of these seasonally limited water sources, either by grazing or recreation uses, will intensify the conflict.

Key Features

Recreation is a major and growing use in the planning area; accordingly, key features are areas where grazing and recreation uses are currently in conflict, and areas where there is the potential for increased conflict between grazing and recreation uses.

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CHAPTER 3
CURRENT MANAGEMENT DIRECTION

This chapter describes the current management direction provided by the existing management plans and amendments. This current management will be the basis for the No Action Alternative in the EIS. Management decisions in this chapter are those land use plan-level decisions relevant to livestock grazing. Not every land use plan-level decision related to the topics below has been included, and this chapter is not inclusive of all guidance contained in the referenced plans. The BLM evaluated decisions for water, soils, and recreation and determined that additional management direction might be needed for these resources but that no changes to current management were needed. Therefore, current management for these resources is not included.

Select current management from the Glen Canyon GzMP and the Interagency Agreement between the BLM and NPS for Grazing Management on Glen Canyon National Recreation Area is provided for context.

3.1 RELEVANT PLANS AND AMENDMENTS

Management direction for livestock grazing comes primarily from the four MFPs, the Escalante MFP Amendment, and the Glen Canyon GzMP. The record of decision for this EIS will replace the four MFPs and the Escalante MFP Amendment and will amend the MMP and the Glen Canyon GzMP. Table 3-1, Relevant Plans and Amendments, shows those documents that are applicable to resources and resource uses discussed in this AMS.

Table 3-1
Relevant Plans and Amendments

Document Title	Abbreviation
Escalante Management Framework Plan (BLM 1981a)	Escalante MFP
Paria Management Framework Plan (BLM 1981b)	Paria MFP
Vermilion Management Framework Plan (BLM 1981c)	Vermilion MFP
Zion Management Framework Plan(BLM 1981d)	Zion MFP
Escalante Management Framework Plan Approved Amendment and Record of Decision (BLM 1999)	Escalante MFP Amendment
Glen Canyon General Management Plan (NPS 1979)	GMP

Table 3-1
Relevant Plans and Amendments

Document Title	Abbreviation
Glen Canyon National Recreation Area Grazing Management Plan and Environmental Assessment (NPS 1999)	GzMP
Grand Staircase-Escalante National Monument Management Plan (BLM 2000)	MMP
Interagency Agreement between BLM and NPS for Grazing Management on Glen Canyon National Recreation Area (1993)	Interagency Agreement

The 1999 MMP deferred decisions related to livestock grazing because "Monument designation does not affect existing permits or leases for, or levels of, livestock grazing" (BLM 2000, p.4). The MMP (p.4) continues that "grazing will ultimately be addressed after the completion of assessments for each grazing allotment and the preparation of new allotment management plans."

The MMP included one specific grazing decision (GRAZ-1) that described a process for grazing management and included a schedule for completing the three-step process GSENM-wide, as follows:

1. An assessment
2. A determination of rangeland health and evaluation of existing grazing management
3. Development of allotment management plans

The BLM completed Steps 1 and 2 in 2006 when the BLM issued rangeland health determinations. Step 3 of the process indicated that the allotment management plans would designate lands available for livestock grazing; the MMP did not identify lands available for livestock grazing use. Step 3 has not been completed, and the BLM continues to follow the livestock grazing decisions made in the 1981 MFPs as amended.

3.2 Livestock Grazing

Decisions in Table 3-2 are applicable to administration of livestock grazing in Glen Canyon to the extent that they conform to the Glen Canyon enabling legislation, the Organic Act, the Glen Canyon GMP, and other NPS regulations and policies. Implementation actions are subject to review by the Glen Canyon Superintendent to determine effects on the values and purposes.

Table 3-2
Current Management for Livestock Grazing in GSENM

Decision	Planning Decision Number	Source
Grazing Management Process The following process will be followed so that grazing management conforms with the grazing regulations and Utah's Standards and Guidelines. In this process, each grazing allotment will be assessed, and new allotment management plans will be developed, consistent with the BLM-wide grazing permit renewal process. ***Step 1: Assessment*** All allotments will be assessed in accordance with the guidelines and guidance issued by the BLM. All available data will be used to make an overall assessment of rangeland health, including ecological processes, watershed functioning condition, water quality conditions, special status species, and wildlife habitat conditions for each allotment, as described in the Utah Standards for Rangeland Health, in light of the Fundamentals of Rangeland Health at 43 CFR § 4180.1. Priorities for completing the assessments and implementing needed changes will be set using the following criteria: • presence of values that are regulated by operation of law such as water quality, threatened and endangered or sensitive plant and animal species • areas at high risk of becoming degraded, or high public interest areas • permit renewal schedule ***Step 2: Determination of Rangeland Health and Evaluation of Existing Grazing Management*** The GSENM Manager shall determine rangeland health for each allotment according to the Utah Standards and Guidelines for Grazing Administration, in light of the Fundamentals of Rangeland Health. The GSENM Manager determines whether or not assessment results show that each allotment is achieving or making significant progress toward the Utah Standards.	GRAZ-1	MMP

Table 3-2
Current Management for Livestock Grazing in GSENM

Decision	Planning Decision Number	Source
To the extent any assessment result is found to be inconsistent with the Standards, the GSENM Manager shall determine whether or not existing livestock grazing practices or levels of use are significant factors in such inconsistency. The GSENM Manager shall take appropriate action under 43 CFR Subparts 4120, 4130, and 4160 as soon as practicable, but not later than the start of the next grazing year, upon determining that existing grazing management practices or levels of grazing on public lands need to be modified to conform with Utah Standards and Guidelines. ***Step 3: Develop Allotment Management Plans*** The compatibility of grazing with other land uses will be evaluated in allotment management plans (AMP), and the results of the evaluation will be consistent with all applicable legal authorities, including the FLPMA, the Taylor Grazing Act, the Public Rangelands Improvement Act, 43 CFR Part 4180, Utah Standards and Guidelines, and National Wildlife Federation v. BLM, 140 Interior Board of Land Appeals 85 (1997). AMPs may be developed on an individual basis, or may be developed for a group of allotments where similar ecosystems or land uses exist. These AMPs may include integrated activity planning, addressing a range of non-grazing issues within the plan area. ***Schedule*** The 3-step Grazing Management Process described above, and all associated National Environmental Policy Act (NEPA) documents, shall be completed within the 3 years commencing on the first July 1 following the approval of the Monument Management Plan.		
During the interim period until intensive livestock management is achieved, maintain existing production of desirable livestock forage consistent with meeting plant and soil requirements. This includes regulating livestock numbers, season of use, and allowing AUMs for grazing on allotments to the extent of the existing carrying capacity of suitable range.	RM-1	Escalante MFP *This is from the Escalante MFP but is also a summary of the objectives from the other MFPs.*
As allotments are evaluated through monitoring studies, the season of use can be adjusted to fit current conditions and operator needs consistent with other resource objectives (Escalante MFP RM-1.1 Analysis).	RM-1.1	Escalante MFP

Table 3-2
Current Management for Livestock Grazing in GSENM

Decision	Planning Decision Number	Source
As management is modified, the forage allocations will be adjusted accordingly. These adjustments will come through coordinated efforts with ranchers and other interested parties (Escalante MFP RM-1.2).	RM-1.2	Escalante MFP
Mitigate recreation interactions by fencing recreation sites when developed, and restricting water hauling in Fiftymile Mountain and Paria Canyon recreation lands to existing roads and trails.	RM- 1.1 or RM-1.2	Paria MFP
Critical riparian areas that are accessible to livestock will be fenced to keep cattle out (WL-3.1 [of the Zion MFP]).	RM-1.2	Zion MFP
Improve the condition on suitable and potentially suitable Federal range that is now in poor condition and achieve an upward trend on range that is in a static or downward trend. Increase the production through intensive grazing management and land treatment projects.	RM-2	Escalante MFP *(similar actions are included as RM-2 in the other three MFPs)*
Adjust each grazing allotment in the planning unit to the carrying capacity of the range and adjust the grazing period on the allotments proposed for winter grazing until after seed ripe time for key species as called for in RM-1.1 and RM-1.2 [of the Vermilion MFP].	RM-2.2	Vermilion MFP
Provide for intensive livestock management by construction of developments and facilities.	RM-2.4	Escalante MFP *(similar in 2.5 in Vermilion and Zion)*
Complete land treatments.	RM-2.5	Escalante MFP *(similar in 2.6 from Vermilion and Zion)*
Continue the unallotted status on Antone Flat, Flag Point, and Varney Griffin by not allocating livestock forage on this area. Protect the relict characteristics of No Man's Mesa.	RM-2.8 RM-3	Escalante MFP Vermilion MFP
Close the following allotments to grazing and allocate the AUMs to uses other than livestock grazing: Allotment — AUMs Escalante River — 2,422 McGath Point — 60 Saltwater Creek — 120 Steep Creek — 316		Escalante MFP Amendment

Table 3-2
Current Management for Livestock Grazing in GSENM

Decision	Planning Decision Number	Source
Close to grazing the portion of the Big Bowns Bench (598 AUMs), Deer Creek (83 AUMs), and Phipps (140 AUMs) allotments that are located in the Escalante River. Close the Cottonwood pasture (112 AUMs) of the Deer Creek allotment. The available forage in these areas would be allocated to uses other than livestock grazing.		Escalante MFP Amendment
Create a grass bank or forage reserve with the remaining AUMs on Phipps allotment (140 AUMs) and all available forage on Little Bowns Bench allotment (130 AUMs) and the Wolverine pasture (148 AUMs) of the Deer Creek allotment. This grass bank would only be used during emergencies or for research purposes. Emergencies would include, but would not be limited to drought, insect outbreaks, fire or floods. Any emergency use would not exceed current authorized use and could occur from October 1 to March 31.		Escalante MFP Amendment
Use in Horse Canyon would be restricted to that part of the trail going onto Big Bowns Bench to the trail leaving Horse Canyon going onto King Bench. This area would only be used as a holding pasture to gather livestock at the end of the grazing season.		Escalante MFP Amendment
Livestock grazing allotments will be evaluated, and grazing as it relates to all endangered species will be addressed during this process. Evaluations will incorporate the latest research and information in the protection of species. Section 7 consultation will be conducted for all allotments that may affect listed species during the individual allotment evaluations. This process will provide protection for listed and sensitive species as the evaluation will be site specific for each of the allotments.	SSA-8	MMP
Actions will be taken to improve identified habitat [for Kanab Ambersnail *Oxyloma hadeni kanabensis*] as consistent with the recovery plan objectives. Actions may include assuring flows in appropriate streams and seeps by removing non-native plants affecting the water table and reducing impacts from visitors and/or livestock. Surveys will also identify current habitat and habitat that is potential if modifications are made.	SSA-24	MMP
Grazing permits are also in this category [Existing Rights or Interests for Other Land Use Authorizations]. Grazing permits or leases convey no right, title, or interest in the land or resources used. Although the Proclamation specifically mentions livestock grazing, it does not establish it as a "right" or convey it any new status. The proclamation states that "grazing shall continue to be governed by applicable laws and regulations other than this proclamation," and says that the Proclamation is not to affect existing permits for, or levels of, livestock grazing with the Monument. Other applicable laws and regulations govern changes to existing grazing permits and levels of livestock grazing in the Monument, just as in other BLM livestock grazing administration programs.	VER-8	MMP

Table 3-2
Current Management for Livestock Grazing in GSENM

Decision	Planning Decision Number	Source
Water developments can be used as a management tool throughout the Monument for the following purposes: better distribution of livestock when deemed to have an overall beneficial effect on monument resources, including water sources or riparian areas, or to restore or manage native species or populations. They can be done only when a NEPA analysis determines this tool to be the best means of achieving the above objectives and only when the water development would not dewater streams or springs. Developments will not be permitted to increase overall livestock numbers. Maintenance of existing development can continue, but may require NEPA analysis and must be consistent with objectives of this Plan.	WDEV-1	MMP
Wildlife Services (formerly Animal Damage Control) activities within the Monument will be limited to the taking of individual coyotes within the immediate vicinity after verified livestock kills, where reasonable livestock management measures to prevent predation had been taken and had failed. Reasonable livestock management measures could include preventative measures to control predation, such as managing where calving occurs, in order to develop improved land management practices.	WS-1	MMP
Fences may be used in certain circumstances to protect Monument resources, to manage visitor use, and to manage livestock, consistent with the Proclamation. They will be designed and constructed in accordance with visual resource management objectives and the Monument Facilities Master Plan (see the *Visual Resource Management* section [in the MMP] for related decisions).	FENCE-1	MMP
In developing allocation plans for areas, efforts will be made to coordinate with other resource planning efforts (e.g., research, grazing allotment management plans), as discussed in the implementation and adaptive management framework in Chapter 3 [of the MMP]. This type of integrated activity planning will lead to more comprehensive planning efforts for specific areas and to better decision making.	ALLO-8	MMP
The BLM will be responsible for administrative routes which will be limited to authorized users. These are existing routes that lead to developments which have an administrative purpose, where the BLM or some permitted user must have access for regular maintenance or operation. These authorized developments include such things as powerlines, cabins, weather stations, communication sites, spring developments, corrals, and water troughs. Routes designated open for certain administrative purposes (approximately 182 miles) are shown on Map 2 [of the MMP]. Access will be strictly limited and will only be granted for legitimate and specific purposes. Maintenance will be the minimum required to keep the routes open for limited use by high clearance vehicles. If the	TRAN-15	MMP

Table 3-2
Current Management for Livestock Grazing in GSENM

Decision	Planning Decision Number	Source
administrative purpose of the route ceases, the route will be evaluated for closure following public notification and opportunity to comment. Authorized users could include grazing permittees, researchers, State or Federal Agencies, Native American Indians accessing recognized traditional cultural properties, and others carrying out authorized activities under a permit or other authorization.		
Beyond the routes shown on Map 2 [of the MMP], the BLM will work with any individual operating within the Monument under existing permits or authorizations to document where access must continue in order to allow operation of a current permit or authorization. Routes that go only to BLM range monitoring and study areas will not be maintained, but periodic vehicular access to these sites will be granted for required range monitoring uses.	TRAN-16	MMP

Table 3-3
Current Management for Livestock Grazing in Glen Canyon

Decision	Planning Decision Number	Source
Special Status Species		
To protect healthy populations of special status species, including federally listed threatened and endangered species, federal candidate C1 and former C2 species, and state heritage ranked rare and sensitive species (NPS/USFWS). Appendix D [of the GzMP] lists 18 special status species that occur within Glen Canyon. Of the three federally protected species, one (*Pediocactus bradyi*) occurs in an area not currently grazed, but the second (*Cycladenia jonesii*) occurs in an active allotment. However, this latter species prefers habitats that are largely inaccessible to livestock, and the species appears to currently sustain little or no impact through grazing activities. A biological assessment of the potential impacts of grazing on *C. jonesii* has not been completed. Of the former federal C2 candidates (now NPS sensitive), four occur in or near hanging gardens (*Erigeron kachinensis, E. zothecinus, Habenaria zothecina,* and *Perityle specuicola*), two are found on or near the Tropic Shale in the Warm Creek area (*Camissonia atwoodii* and *Cymopterus higginsii*), and two occur in sandy and	Objective 2	GzMP

Table 3-3
Current Management for Livestock Grazing in Glen Canyon

Decision	Planning Decision Number	Source
rocky desert shrublands in the middle part of the recreation area. (*Dalea flavescens* var. *epica* and *Psorothamnus thompsonae* var. *whitingii*). Finally, seven proposed Utah state sensitive species are included. All but one of these species occurs in riparian zones and hanging gardens (Viguiera soliceps occurs on Tropic Shale badlands). Two species (*Imperata brevifolia* and *Aralia racemosa*) are known from only one locality each within Glen Canyon. *Desirable conditions.* Special status species will not be subject to grazing if studies show that impacts occur. 1. Determine population biology and ecology of species to assess if grazing causes significant impacts to populations. 2. Consult with US Fish and Wildlife Service through Section 7 compliance procedures. 3. If impacts are discovered and the species or populations require protection, determine the best method, including but not limited to fencing, changes in grazing seasons or pasture rotations, or removal of grazing.		
Recreation/Livestock Conflicts		
Protect recreation resources and the visitor experience (enjoyment and use) by reducing or mitigating recreation/livestock conflicts.	Goal	GzMP
Prevent or reduce livestock/ recreation conflicts so that recreational use and enjoyment of the recreation area is not impaired. (NPS/BLM)	Objective 1	GzMP
Range Improvements and Management		
All livestock use facilities (constructed after May 10, 1993) will be authorized only with a BLM cooperative agreement, as provided for under 43 CFR Part 4100.	N/A	Interagency Agreement
Nonstructural range improvements, land treatments, and new line shacks are not appropriate in Glen Canyon.	N/A	Interagency Agreement
When grazing permits are canceled or modified for other than public purposes, existing range improvements will be evaluated for abandonment or removal. Removal may be completed by the benefitting party, owner, or agency.	N/A	Interagency Agreement
The use of supplemental feed, including salt, may be authorized for improved livestock and rangeland management. Maintenance feeding of harvested feed (hay and grain not in block form or otherwise regulated by salt) are not appropriate in Glen Canyon, except in emergencies with NPS concurrence.	N/A	Interagency Agreement

3.3 VEGETATION

Management decisions in Table 3-4 are applicable only to BLM-managed lands in GSENM.

Table 3-4
Current Management for Vegetation in GSENM

Decision	Planning Decision Number	Source
General		
The Monument will be managed to achieve a natural range of native plant associations. Management activities will not be allowed to significantly shift the makeup of those associations, disrupt their normal population dynamics, or disrupt the normal progression of those associations. Additionally, the BLM will work to: • increase public education and appreciation of vegetation through interpretation, • facilitate appropriate research to improve understanding and management of vegetation, and • protect unique vegetation associations such as hanging gardens and relict plant associations	Goal	MMP
Vegetation Restoration Methods		
A variety of vegetation restoration methods may be used to restore and promote a natural range of native plant associations in the Monument. Methods and project which do not achieve this objective or which irreversibly impact Monument resources will not be permitted. Vegetation restoration methods fall into four broad categories: mechanical, chemical, biological, and management ignited fires. Each of these methods will be used in accordance with the overall vegetation objectives discussed above, and progress towards these objectives will monitored as part of the adaptive management framework described in Chapter 3 [of the MMP].	Objective	MMP
Mechanical methods, including manual pulling and the use of hand tools (e.g., chainsaws, machetes, pruners) may be allowed throughout the Monument.	RM-1	MMP
The use of machinery (e.g., roller chopping, chaining, plowing, discing) may be allowed in all zones except the Primitive Zone. Chaining has been used in the past to remove pinyon and juniper prior to reseeding with perennial grasses. Due to the potential for irreversible impacts to other Monument resources, such as archaeological sites and artifacts, and paleontological resources, this treatment method will not be used to remove pinyon and juniper. It may be allowed to cover rehabilitation seed mixes with soil after wildfires only where: • noxious weeds and invasive non-native species are presenting a significant threat to Monument resources or watershed damage could occur if the burned area is not reseeded, • it can be demonstrated that Monument resources will not be detrimentally affected (i.e., completion of full	RM-2	MMP

Table 3-4
Current Management for Vegetation in GSENM

Decision	Planning Decision Number	Source
archaeological, paleontological, threatened and endangered species and other resource clearance and consultation), • it is determined that seed cover is necessary for the growth of the native species proposed for seeding, and • other less surface disturbing measures of covering seed are not available or cannot be applied in a timely manner. Visual impacts of chaining will also be minimized near routes and other points of concern by covering the native seed mix with harrows or light chains. The GSENM Advisory Committee will be consulted before the use of machinery for treatments is permitted.		
Livestock grazing after native seedings are established will be modified to ensure the survival of the native plants. The livestock exclusion period required to allow full establishment of seeded native species and recovery of surviving native plants after a wildfire may be more than two years. Site evaluation will be required to determine when the native seedings should be grazed again and the effectiveness of the current or new grazing system on the persistence of native plants.	RM-3	MMP
Chemical methods will generally be restricted to the control of noxious weed species, and are discussed in that section. The use of chemicals may also be allowed in conjunction with research projects and must lead to the achievement of the overall vegetation objectives. These activities will be approved as determined appropriate through consultation with the GSENM Advisory Committee.	RM-4	MMP
With all of the methods described above, vegetation monitoring plots will be established to determine the effectiveness of the treatments in achieving management objectives and to provide baseline data of overall change. This monitoring will include species frequency, density, and distribution data, and will be part of the overall adaptive management framework described in Chapter 3 [of the MMP].	RM-7	MMP
Noxious Weed Control		
In addition to strategies for control of established noxious weeds, it is also imperative to reduce the introduction of noxious weed species as stated in Presidential Executive Order (EO 11312) on invasive species. Cooperative programs established for control of these species will also help identify potential new invasions before area-wide establishment has occurred. There are two policies which will help to reduce potential noxious weed introduction. • First, the BLM requires that all hay used on BLM lands be certified weed free. This is a statewide policy which applies to the Monument, as well as all other BLM lands in the State of Utah.	NW-7	MMP

Table 3-4
Current Management for Vegetation in GSENM

Decision	Planning Decision Number	Source
• Second is the requirement that all machinery that has been used outside the Monument be cleaned prior to use in the Monument. This provision generally applies to contract equipment used for projects such as construction of facilities and firefighting equipment. Both of these provisions will help reduce the introduction and spread of noxious weed species in the Monument.		
Native vs. Nonnative Plants		
In keeping with the overall vegetation objectives and Presidential EO 11312, native plants will be used as a priority for all projects in the Monument.	NAT-1	MMP
Non-native plants may be used in limited, emergency situations where they may be necessary in order to protect Monument resources by stabilizing soils and displacing noxious weeds. This use will be allowed to the extent that it complies with the vegetation objectives, Presidential EO 11312, and the *Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah* (1997). In these situations, short-lived species (i.e., nurse crop species) will be used and will be combined with native species to facilitate the ultimate establishment of native species.	NAT-2	MMP
All projects proposed in the Monument will contain a restoration or revegetation component and will budget for the cost of seeding with native species. All planning for projects, in all except limited, emergency situations, will use native species, and the use of non-native species will not be analyzed as an alternative.	NAT-3	MMP
Non-native plants may be used for restoration related research if the use is consistent with and furthers the overall vegetation management objectives, including NAT-2 above, and after consultation with the GSENM Advisory Committee.	NAT-4	MMP
Non-native plants will not be used to increase forage for livestock and wildlife.	NAT-5	MMP
Monitoring plots will be established in any areas where non-native plants are used in order to document changes in vegetation structure and composition and will be an integral part of the adaptive management framework described in Chapter 3 [of the MMP].	NAT-6	MMP
Restoration and Revegetation		
Many factors will be considered when deciding to implement a revegetation or restoration strategy. Each project and area to be treated will be evaluated to determine the appropriate strategy. The following general guidelines can be applied to determine which strategy is the most appropriate and how it will be implemented in order to be consistent with the overall vegetation management objectives. 1. Restoration will be the goal whenever possible (i.e., an attempt will be made to return disturbed areas to conditions which promote a natural array of native plant and animal associations). 2. Species used in both restoration and revegetation projects will comply with the non-native plant policy	REV-1	MMP

Table 3-4
Current Management for Vegetation in GSENM

Decision	Planning Decision Number	Source
described above (i.e., native plants will be used as a priority). 3. Revegetation strategies will be used in areas of heavy visitation, where site stabilization is desired. 4. Restoration provisions will be included in all surface disturbing projects including provisions for post restoration monitoring of the area. Costs for these activities will be included in the overall cost of the project and will come out of the entire project budget. 5. Priority for restoration or revegetation will be given to projects where Monument resources are being damaged. These sites will likely be in areas near development and/or heavy visitor use. Although these areas are more likely to be candidates for revegetation projects, careful evaluation of disturbed sites needs to be conducted to include desired future condition of an area. Restoration or revegetation of areas receiving heavy use may include limits on visitor use in order to promote recovery.		

Table 3-5
Current Management for Vegetation in Glen Canyon

Decision	Planning Decision Number	Source
General		
Maintain naturally diverse plant communities and species populations similar to Potential Natural Community composition (see Appendix C [of the Glen Canyon GzMP]). These include a full complement of native species, plant vigor and health, natural structure for wildlife habitat, dynamic changes, reproductive success, and populational genetic and evolutionary responses. The objectives and various actions to be taken to meet the objectives are listed below. The particular action taken will depend on the characteristics of the vegetation and location. Generally, if an allotment is in Maintenance condition, then the proposed actions for each objective may not be needed. However, if the allotment is not in the Maintenance category, one or more of the following objectives and actions may be necessary.	Goal	GzMP
Maintain in upland (dry site) plant communities, as natural a community as possible, including the full range of native species, a viable seedbank, and minimal presence of increasing undesirable species (BLM/NPS).	Objective 1	GzMP

Table 3-5
Current Management for Vegetation in Glen Canyon

Decision	Planning Decision Number	Source
Desirable Conditions. Potential natural community composition for major plant communities is based on standard descriptions in the Natural Resource Conservation Service (NRCS) O-35 Green River resource area and field work done in Glen Canyon (see Appendix C [of the Glen Canyon GzMP]). These composition values provide the target requirements in most cases for vegetation condition within Glen Canyon. Unless otherwise stated, the potential natural community is the desired plant community. In certain situations, such as in the case of maintaining a special status species, or where fire plays a role, desirable vegetation status may depart from the potential natural community or late seral requirements. Biomass and cover values for key species and life form groups in these tables should be considered approximate and somewhat idealized. It is unlikely that vegetation exactly corresponding to the values in these tables exists. Furthermore, many land site descriptions are based on examples elsewhere in the NRCS Green River Resource Area, and are not specifically based on sites in Glen Canyon. The reported values should be used in conjunction with information on site conditions (landforms, elevation, slope, fire history, other disturbances) that can cause variation in the abundances of many species. Undesirable species that occur in Glen Canyon are also listed in Appendix C [of the Glen Canyon GzMP]. It is recognized that there are alternative theories to the traditional potential natural community concept. In particular, recent work has validated the "state and transition" approach which suggests that traditional techniques of vegetation manipulation through stocking rates may be inadequate in many plant communities. Some vegetation has been altered to such an extent by past disturbances (e.g., fire, grazing, construction, establishment of exotics) that simply adjusting stocking rates or even removal of livestock will not cause a shift in community composition towards the potential natural community stage. Currently the NPS is conducting field studies in Glen Canyon on the utility of these newer approaches to grazing management. Until this work is finished, the potential natural community condition will be retained as a useful goal, recognizing that in some cases reduction in stocking rates or removal of livestock may not lead to the desired future condition. The following items 1 through 8 are actions that may be taken to attain the desirable targets and accomplish Objective 1. 1. Establish maximum utilization levels of 45% for Indian ricegrass in all key areas in allotments within Glen Canyon, and also for other key species as necessary, until vegetation meets desirable community composition (potential natural community). 2. In allotments or pastures that are grazed in spring, utilization of Indian ricegrass and other key species will		

Table 3-5
Current Management for Vegetation in Glen Canyon

Decision	Planning Decision Number	Source
not exceed 25%. 3. In non-nonmaintenance or other high-priority allotments, utilization of Indian ricegrass and other key species will not exceed 25% in spring. The established utilization level is based on key areas, selected in consultation with the BLM. Key areas are those that, 1) are representative of the area's vegetation, 2) support sufficient amounts of the key species, and 3) are utilized but are not areas of congregation (e.g., such as happens around watering sources). Generally, key areas are situated at least from 1/2 to 1 mile from areas of heavy use (such as around stock ponds). The principal key species utilized in Glen Canyon is Indian ricegrass *(Stipa hymenoides)* but at higher elevations needle-and-thread *(Stipa comata)* and sand dropseed *(Sporobolus cryptandrus)* are also important. Other species that can be used as indicators include Galleta grass *(Hilaria jamesii)*, mormon teas *(Ephedra cutleri* and *E. viridis)*, winterfat *(Eurotia lanata)*, and four-wing saltbush *(Atriplex confertifolia*; see Appendix C [of the Glen Canyon GzMP]). In addition to these key areas for forage utilization, others may be chosen, in consultation with the BLM, near areas with recreational activities or in areas where important resources (natural or cultural) occur that are of importance to Glen Canyon. Utilization levels are based on standards used by the BLM. Utilization in spring and fall should not exceed 50%, and 60% in the winter. C. Wayne Cook (National Wildlife Federation vs. BLM 1993) suggests that yearly utilization at 60% in winter on the Colorado Plateau is probably too high. He also pointed out that in pastures grazed every year spring utilization of 50% was too high, and that in order to allow for reproduction 25% was the maximum allowable utilization. Levels have been set at 45% in key areas in this plan for all grazing periods, except under conditions (see above) where spring utilization should not exceed 25%. Once 45% utilization of Indian Ricegrass, and if deemed necessary other key species has been reached, livestock will be moved from the area. 4. Adjust grazing seasons for Glen Canyon allotments until vegetation meets desirable community composition (potential natural community). [Note: Refer to GzMP for details.] Grazing seasons are defined in the table above for low (below 5,000 feet) and high (above 5,000 feet) elevations. In general, pastures or allotments with both elevational zones will be managed for the more sensitive communities, usually those below 5000'. Seasons of use may deviate from the table if utilization is below 45%, a grazing system is in place, and ecological trend is stable or improving. The spring grazing season has been somewhat shortened in order to allow for adequate reproduction by Indian ricegrass. Key species are listed by resource area and allotment in Appendix C.		

Table 3-5
Current Management for Vegetation in Glen Canyon

Decision	Planning Decision Number	Source
5. Maintain or increase amounts of desirable plant species and keep low or reduce numbers of undesirable increasing species (potential natural community; see Appendix C [of the Glen Canyon GzMP]). Butler et. al. (1994) note that snakeweed (*Gutierrezia* species) is a good indicator of range in poor condition in the recreation area. Since snakeweed can be an increaser (or sometimes an invader) on Glen Canyon range that has been overgrazed, it can serve as an indicator of range in poor condition. However, snakeweed also has a strong cyclic nature dependent on climate, and increases in abundance on a site may reflect factors other than grazing. Any use of the species as an indicator must take this into account. Natural levels of snakeweed can be found in the potential natural community composition tables for the communities in Glen Canyon. Other groups of species that appear to be related to overgrazing are the locoweeds (selected *Astragalus* species), principally *A. lentiginosus* and *A. praelongus*, and the larkspurs (Delphinium). These species may be poisonous to livestock, as many contain toxic levels of chemicals like selenium, nitrotoxins, locoine, and delphinine. These three groups can be used as indicators of change in areas where they occur. Increases in populations of these taxa in selected key areas, in combination with decreases in desirable or key species, will be used to indicate that changes in grazing activity may be needed. In some cases, particular climate events can trigger heavy growth and flowering in many locoweeds, so presence and abundance must be used with care in evaluating range conditions. 6. Establish trend plots in key areas to determine successional trend and ecological status. 7. Establish grazing exclosures in key areas through consultation with the BLM to determine long term effects and recovery from livestock grazing, as well as how climate affects species growth and abundance. Exclosures of sufficient size (a minimum of 30 m X 30 m) provide valuable baseline data on how climate and other factors affect vegetation independently of livestock grazing. Such baseline data can be used to determine if declines in selected species (e.g., key species) result from climate change (drought), grazing, or a combination of these as well as other factors. The number of exclosures or transects depends on the level of precision needed to detect change in monitored species. Brady et. al. (1995) provide a useful summary of sample sizes for the point count transect method, which is similar to some BLM monitoring techniques. 8. Adjust stocking rates or change grazing prescription until key areas meet late seral or potential natural community composition criteria (see Appendix C [of the Glen Canyon GzMP]). For specially designated areas (Research and Protected Natural Areas; see objective 3), conditions must meet potential natural community composition criteria, as set forth above.		

Table 3-5
Current Management for Vegetation in Glen Canyon

Decision	Planning Decision Number	Source
Determine the current status and trend of the grazed rangelands in Glen Canyon (NPS/BLM). Baseline data are not available for all grazed portions of Glen Canyon. This objective is designed to provide data essential for proper management of grazing activities and proper use of annual forage production. The results of this work may indicate changes are necessary in potential natural community composition. Complete classification and inventory of the ecological status and successional trend of the upland vegetation in Glen Canyon, using the methods and steps outlined below. 1. Compile and analyze existing data. 2. Inventory the current status of the upland arid and semi-arid vegetation, including species richness, diversity, structure, and successional status. 3. Establish permanent monitoring transects to determine future trends. 4. Establish permanent photographic points in association with permanent transects. 5. Revise the current vegetation classification for the recreation area, incorporating new data. Establish baseline community classification criteria to direct management of grazing.	Objective 5	GzMP
Riparian		
Protect wetlands, riparian zones, and spring and seep vegetation (NPS/BLM). These communities support much of the biodiversity in Glen Canyon (Spence 1995). They also provide critical habitat for the majority of the wildlife species in the recreation area (cf. Johnson 1989). Many riparian communities in Glen Canyon are of major scientific importance (Spence 1995). Baseline data on riparian vegetation is lacking from much of Glen Canyon. Desirable conditions can be developed from data supplied by Spence (1995), who surveyed and classified permanent riparian zones in side canyons of Lake Powell (see Appendix C [of the Glen Canyon GzMP]). Inventory techniques and terminology are derived from Platts et. al. (1987; also see Myers 1989, pp. 16-23). Key riparian species are listed in Appendix C [of the Glen Canyon GzMP]. Riparian reaches (zones or sections of stream) to monitor will be selected in consultation with the BLM. Principal monitoring techniques include Proper Functioning Condition assessment (BLM 1993) and Greenline Riparian and Wetland monitoring (Cagney 1993). Other techniques and approaches will be developed in consultation with the BLM and where possible with BLM inventory and monitoring protocols (Myers 1989).	Objective 4	GzMP

Table 3-5
Current Management for Vegetation in Glen Canyon

Decision	Planning Decision Number	Source
For key riparian reaches in high priority or non-M allotments, maintain populations of all native species and specific conditions detailed below. 1. Streambank alteration (e.g., bank collapse, loss of vegetation) shall not exceed 25% for streambanks in key areas (see Platts et al. 1987, pp. 75-83; Myers 1989, pp. 16-23 for definitions and methods). 2. Browse (of previous years growth) and forage utilization (of current years growth) shall not exceed 30% in key areas. 3. Reduce abundance of undesirable species to low levels (<5%) in areas where present (show declines through monitoring), and prevent establishment of undesirable species in areas where they are currently not present (see Table 9; Appendix C [of the Glen Canyon GzMP]). 4. Establish monitoring transects for vegetation status and trend determination in areas currently not meeting desirable conditions. Adjust stocking rates, rest periods, reduce length of season, change season of use, or remove livestock until desirable conditions are met.		
Scientifically Important Areas		
Manage and protect scientifically important areas and hanging gardens to prevent grazing induced changes (NPS). Appendix E lists known scientifically important areas within Glen Canyon other than hanging gardens. Studies by the NPS and The Nature Conservancy have documented that these areas support important plant communities, including ungrazed relicts, and often include sensitive plant species. At present, none are established Research Natural Areas. No grazing will be allowed in the identified relict areas (approximately 12,000 acres) because of their importance to Glen Canyon resource values, management, or scientific research. No range developments will be authorized in scientifically important areas. The NPS will seek Research Natural Area designation for all eligible relict and near relict (relict areas that have been grazed but not severely altered) areas. Two additional categories, Protected Natural Area and Experimental Research Area, may be used as they provide additional important management options for areas that do not meet Research Natural Area criteria. Protected Natural Areas are based on important natural features that are generally smaller in size than areas with a Research Natural Area designation, or they are to protect single important resources (such as a specific patch of vegetation). Experimental Research Areas are already disturbed but are useful for comparisons and for research on the impacts of various kinds of disturbances,	Objective 3	GzMP

Table 3-5
Current Management for Vegetation in Glen Canyon

Decision	Planning Decision Number	Source
including grazing. *Desirable Conditions.* Sensitive plant communities of importance for scientific research will not be subject to livestock grazing impacts. 1. Prioritize areas according to immediacy of threats, and importance of resource to Glen Canyon. 2. Determine if Research Natural Area, Protected Natural Area or Experimental Research Area designation, and/or fencing is most appropriate to protect the site. 3. Prepare Experimental Research Area, Protected Natural Area or Research Natural Area justification report. 4. Consult with BLM on ways to exclude livestock from Protected Natural Areas or Research Natural Areas.		
Predator, Plant, and Pest Control		
Predator, pest, and noxious weed control activities will be authorized and carried out by NPS. Control efforts will be approved by NPS in coordination with the US Department of Agriculture Animal Plant Health Inspection Service (APHIS). NPS will coordinate directly with APHIS if any predator or pest control work is necessary in Glen Canyon and will complete all necessary NEPA documentation.	N/A	Interagency Agreement

Sources:
BLM. 1993. Process for assessing proper functioning condition. Bureau of Land Management Technical Reference 1737-9.
Brady, W. W., J. E. Mitchell, C. D. Bonham, and J. W. Cook. 1995. "Assessing the power of the point-line transect to monitor changes in plant basal cover." *Journal of Range Management* 48:187-190.
Butler, J. L., and K. J. Painter. 1994. Rangeland Recovery Potential: Soil Seed Content and Seed Viability. Draft Final Report to the National Park Service. University of South Dakota, Vermillion.
Cagney, J. 1993. Greenline riparian-wetland monitoring. Bureau of Land Management Technical Reference 1737-8.
Johnson, A. S. 1989. The thin green line: riparian corridors and endangered species in Arizona and New Mexico. pp. 35-46 In Preserving Communities and Corridors. Defenders of Wildlife, Washington, DC.
Myers, L. H. 1989. Inventory and monitoring of riparian areas. Bureau of Land Management, Riparian Area Management TR-1737-3.
Platts, W. S., C. Armour, G. D. Booth, M. Bryant, J. L. Bufford, P. Cuplin, S. Jensen, et al. 1987. Methods for evaluating riparian habitats with applications to management. Forest Service General Technical Report INT-221.
Spence, J. R. 1995. A survey and classification of the riparian vegetation in side canyons around Lake Powell, Glen Canyon National Recreation Area. Draft Final Report, National Park Service, Glen Canyon National Recreation Area, Page, Arizona.

3.4 WATER

Management decisions in Table 3-6 are applicable only to BLM-managed lands in GSENM.

Table 3-6
Current Management for Water in GSENM

Decision	Planning Decision Number	Source
The BLM's objective with respect to water resources will be to: • ensure that appropriate quality and quantity of water resources are available for the proper care and management of the objects of the Monument, • increase public education and appreciation of water resources through interpretation, and • facilitate appropriate research to improve management of water resources.	Objective	MMP
Ensure that land management policies protect water resources. Since much of the water important to the Monument falls as precipitation within the Monument, its continued availability can be ensured by appropriate land management policies within the Monument. The BLM will exercise its existing land management authorities to protect and maintain all available water and natural flows in the Monument. Several decisions described in other sections of this Plan are designed to meet this objective. These include the following: • The need for water for visitor facilities within the Monument will be minimal because the only facilities provided will be a relatively small number of modest pullouts, toilets, parking areas, trailheads, and picnic sites. Most of these sites do not require water, including most toilet facilities which could use other technologies. In the limited cases where water is needed for a visitor facility, the acquisition of State appropriative water rights (discussed above) should be possible. • New water developments for other uses could be permitted for the following purposes: better distribution of livestock when deemed to have an overall beneficial effect on Monument resources, or to restore or manage native species or populations. These developments could only be done when a NEPA analysis determines this tool to be the best means of achieving the above objectives and only when the water development will not dewater springs or streams. • In general, diversions of water out of the Monument will not be permitted.	WAT-1	MMP
Pursue other options for assuring water availability, if needed. At any point that the above data collection [described in WAT-2 of the MMP] and assessment effort suggests that adequate water to protect Monument resources is not entering the Monument, or that water is otherwise being depleted to the detriment of the Monument, other measures for assuring water availability will be taken. These measures could include: • Cooperation with other Federal agencies that may already have Federal reserved water rights. Glen	WAT-3	MMP

Table 3-6
Current Management for Water in GSENM

Decision	Planning Decision Number	Source
Canyon is a Federal reservation and has a Federal reserved water right (as yet unquantified) which could indirectly provide adequate protection to the Monument resources. If the United States successfully establishes a Federal reserved water right for [Glen Canyon], that water right would have a priority date of about 1965. The Monument will benefit from this water right, because some of the water necessary to satisfy the [Glen Canyon]'s water needs will pass through the Monument. The BLM will begin discussions with [Glen Canyon] to quantify this water right. • Initiate discussions with the Utah State Engineer (Utah Division of Water Rights), Utah Division of Water Resources, and State and local water users to identify how nearby communities could secure water supplies for expected future growth without interfering with the water flows needed for Monument resources. These discussions will include negotiations toward an agreement between the State and local water users similar to the agreement recently reached for Zion National Park. The Zion agreement (reached between the Department of the Interior, the State of Utah, and local water users) allows additional future non-Federal development of water that could affect the Park, but caps it, and protects the continuation of "spike" or flood events in the Park environment. The BLM will explore options with the State of Utah and local communities, perhaps based on the Zion National Park model, for securing local water needs without jeopardizing the water needs of the Monument. If such an agreement is reached, or if any other agreement is reached with the State under the options below, segments of rivers determined to be suitable for Wild and Scenic River designation in this Plan would be managed in accordance with that agreement. • Other options are available to the BLM for assuring water availability. These are summarized below. <u>Appropriative Water Rights Under State Law</u> options in this category include: Pursuing a cooperative agreement between the BLM and one of the State agencies authorized to acquire and hold an instream flow right (where the State agency has a similar interest in protecting a particular resource); approaching the Utah State Engineer with a request to use his authority to protect natural flows in the Monument by denying water rights applications where the water would serve a more beneficial purpose by remaining in the channel; and, converting BLM held water rights that may no longer be needed for grazing to wildlife rights after an appropriate proceeding to change the water right in the Office of the State Engineer. <u>Federal Reserved Water Rights</u> - The GSENM Proclamation does not reserve water as a matter of Federal law. It does not, however, abolish or defeat the BLM's claims to Federal law-based water rights under other reservations or proclamations. Options in this category include: Public water reserves; Wild and Scenic Rivers (upon designation by Congress, or the Secretary of the Interior upon application of the Utah Governor); Congressional reservation of unappropriated water; and, by Presidential Proclamation.		

Table 3-6
Current Management for Water in GSENM

Decision	Planning Decision Number	Source
Water quality monitoring will be implemented when ground disturbance or other factors could adversely affect water quality. Mitigation will be required if adverse effects are detected.	WAT-6	MMP

Table 3-7
Current Management for Water in Glen Canyon

Decision	Planning Decision Number	Source
Maintain water quality in all natural bodies of water and sources of water (does not include stock ponds or reservoirs) and maintain natural flows to preserve water dependent resources. At a minimum, water quality standards will meet the Utah State water requirements of 303(d) and 317 (e) as defined in the Standards and Guidelines (Appendix B [of the GzMP]).	Goal	GzMP
In all natural surface waters accessible for public use, water quantity and quality including physical/chemical parameters of flow, temperature, conductivity, pH, turbidity, salinity, dissolved oxygen, suspended and dissolved solids, and nutrients will not be degraded (NPS).	Objective 1	GzMP
Bacteriological levels for fecal coliform in natural surface waters will not exceed standards for recreational use (NPS).	Objective 2	GzMP
Preserve naturally occurring aquatic species diversity, composition and abundance (NPS).	Objective 3	GzMP
Maintain integrity of stream morphology, instream flows, riparian zone, and springs' natural emergence (NPS/BLM).	Objective 4	GzMP
Preserve the aesthetic value of natural water. Instream flows will be maintained in natural, unaltered condition (NPS).	Objective 5	GzMP
Ensure access to water sources for wildlife and recreational uses (NPS).	Objective 6	GzMP
All water developments must consider the needs of wildlife and recreation and will not be constructed, maintained, or utilized in such a way as to preclude the access to that source by wildlife or recreation users. Water rights, not presently allocated, will be obtained by NPS.	N/A	Interagency Agreement

3.5 Soil

Management decisions in Table 3-8 are applicable only to BLM-managed lands in GSENM.

Table 3-8
Current Management for Soil in GSENM

Decision	Planning Decision Number	Source
The overall objective with respect to soil resources within the Monument is to: • manage uses to prevent damage to soil resources and to ensure that the health and distribution of fragile biological soil crusts is maintained or improved, • increase public education and appreciation of soils and biological soil crusts through interpretation, and • facilitate appropriate research to improve understanding and management of soil resources and biological soil crusts.	Objective	MMP
The BLM will apply procedures to protect soils from accelerated or unnatural erosion in any ground-disturbing activity, including route maintenance and restoration. The effects of activities such as grazing developments, mineral exploration or development, or water developments will be analyzed through the preparation of project specific NEPA documents. This process will include inventories for affected resources and the identification of mitigation measures.	SOIL-1	MMP
Prior to any ground disturbing activity, the potential effects on biological soil crusts will be considered and steps will be taken to avoid impacts on their function, health, and distribution. Long-term research toward preservation and restoration of soils will be part of the adaptive management framework described in Chapter 3 [of the MMP]. Further research will be conducted on these crusts, and the results interpreted for management and education purposes.	SOIL-2	MMP

Table 3-9
Current Management for Soil in Glen Canyon

Decision	Planning Decision Number	Source
Maintain the evolutionary and ecological processes of the soil ecosystem.	Goal	GzMP
Collect data on rates of soil erosion on various grazed and ungrazed plots, targeting areas showing excessive erosion, such as rills, soil pedestals, or actively eroding gullies (NPS). Use a combination of rangeland monitoring and sedimentation studies to quantify annual losses or gains from selected, established trend and riparian plots. Determine values from plots and compare to expected erosion rates developed by the Natural Resources Conservation Service (NRCS) in all sample areas, through the year 2005.	Objective 1	GzMP
Enhance soil productivity and surface cover by promoting deposition of sufficient cover and litter to protect the soil from excessive water and wind erosion, and to promote infiltration (NPS).	Objective 2	GzMP

CHAPTER 4
MANAGEMENT OPPORTUNITIES

This chapter analyzes the ability of current management direction to achieve desired conditions and address resource demands. This chapter serves as a starting point for alternative formulation by providing a list of possible management opportunities for later sorting and refining into alternatives. Identifying management opportunities is a process of considering changes in management (opportunities to manage and administer the land and people differently) to respond to any problems with existing management practices, information gathered in the area profile, and issues and concerns raised through internal and external scoping.

In assessing current management for water, soil, and recreation, the BLM determined that no changes to current management were needed. However, new management actions to address specific concerns related to livestock grazing may be warranted. For example, there are opportunities to establish thresholds for biological soil crust presence to maintain ecological functions. These sections are not included below.

Current vegetation management is generally adequate as it relates to livestock grazing except that nonstructural range improvements (e.g., seedings) are not addressed. New objectives and actions to address such range improvements are needed. Existing objectives and actions may also be modified to include nonstructural range improvements.

Only management directions from BLM documents are included in the following tables. These decisions apply only to BLM-managed land in GSENM. Livestock grazing in Glen Canyon is guided by the Glen Canyon GzMP and GMP.

4.1 Livestock Grazing

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
Grazing Management Process The following process will be followed so that grazing management conforms with the grazing regulations and Utah's Standards and Guidelines. In this process, each grazing allotment will be assessed, and new allotment management plans will be developed, consistent with the BLM-wide grazing permit renewal process. ***Step 1: Assessment*** All allotments will be assessed in accordance with the guidelines and guidance issued by the BLM. All available data will be used to make an overall assessment of rangeland health, including ecological processes, watershed functioning condition, water quality conditions, special status species, and wildlife habitat conditions for each allotment, as described in the Utah Standards for Rangeland Health, in light of the Fundamentals of Rangeland Health at 43 CFR § 4180.1. Priorities for completing the assessments and implementing needed changes will be set using the following criteria: • presence of values that are regulated by operation of law such as water quality, threatened and endangered or sensitive plant and animal species	GRAZ-1 (MMP)	Partially	Steps 1 and 2 were completed in 2006 when the BLM issued rangeland health determinations. The permit renewal process commonly used by the BLM since about 1999 yields a document that is the functional equivalent to an allotment management plan. This may be a more efficient process for many of GSENM's allotments. The allotment management plan process, as outlined, also substitutes the allotment management plan process into the land use plan by relying on it to determine overall allocations in GSENM as well as the areas available and unavailable for livestock grazing. This is not consistent with BLM guidance for designating lands as available for livestock grazing use. The grazing regulations (43 CFR, Part 4130.2[a]) indicate that grazing permits and leases shall be issued to authorize use on the public lands that are designated as available for livestock grazing through land use plans. These regulations (43 CFR, Part 4100.0-8) also indicate that livestock grazing activities and management actions shall be conformance with the land use plan. The BLM Land Use Planning Handbook (H-1601-1) indicates that

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
• areas at high risk of becoming degraded, or high public interest areas permit renewal schedule ***Step 2: Determination of Rangeland Health and Evaluation of Existing Grazing Management*** The GSENM Manager shall determine rangeland health for each allotment according to the Utah Standards and Guidelines for Grazing Administration, in light of the Fundamentals of Rangeland Health. The GSENM Manager determines whether or not assessment results show that each allotment is achieving or making significant progress toward the Utah Standards. To the extent any assessment result is found to be inconsistent with the Standards, the GSENM Manager shall determine whether or not existing livestock grazing practices or levels of use are significant factors in such inconsistency. The GSENM Manager shall take appropriate action under 43 CFR Subparts 4120, 4130, and 4160 as soon as practicable, but not later than the start of the next grazing year, upon determining that existing grazing management practices or levels of grazing on public lands need to be modified to conform with Utah Standards and Guidelines. ***Step 3: Develop Allotment Management Plans*** The compatibility of grazing with other land uses will be evaluated in allotment management plans (AMP),			land use plan decisions should identify lands available or not available for livestock grazing. Further, the handbook also indicates that for lands available for livestock grazing, identify on an area-wide basis both the amount of exiting forage available for livestock and the future anticipated amount of forage available for livestock with full implementation of the land use plan. The schedule for completing the grazing administration process needs to be updated. So far, none of the grazing permits in the decision area have been fully processed.

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
and the results of the evaluation will be consistent with all applicable legal authorities, including the FLPMA, the Taylor Grazing Act, the Public Rangelands Improvement Act, 43 CFR Part 4180, Utah Standards and Guidelines, and National Wildlife Federation v. BLM, 140 Interior Board of Land Appeals 85 (1997). AMPs may be developed on an individual basis, or may be developed for a group of allotments where similar ecosystems or land uses exist. These AMPs may include integrated activity planning, addressing a range of non-grazing issues within the plan area. ***Schedule*** The 3-step Grazing Management Process described above, and all associated National Environmental Policy Act (NEPA) documents, shall be completed within the 3 years commencing on the first July 1 following the approval of the Monument Management Plan.			
During the interim period until intensive livestock management is achieved, maintain existing production of desirable livestock forage consistent with meeting plant and soil requirements. This includes regulating livestock numbers, season of use, and allowing AUMs for grazing on allotments to the extent of the existing carrying capacity of suitable range.	RM-1 *(This is from the Escalante MFP but is also a summary of the objectives from the other MFPs.)*	No	Because no goals or objectives are currently identified, land use plan decisions need to be made to add goals, objectives, allowable uses, and management actions specific to livestock grazing. In addition, land use plan decisions for other resources such as vegetation may need to be modified in order to integrate livestock grazing with management of other GSENM Resources.

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
As allotments are evaluated through monitoring studies, the season of use can be adjusted to fit current conditions and operator needs consistent with other resource objectives (Escalante MFP RM-1.1 Analysis).	RM-1.1 (Escalante MFP)	Yes	Current process is similar to this direction. Potential for adding other information to inform decisions to adjust allocations. The level and frequency of monitoring by allotment varies across the planning area. Allotments are categorized into I (Improvement), M (Maintenance), and C (Custodial). Generally, Category I allotments are monitored more frequently than allotments in the other categories. Since 2000 monitoring or assessments have occurred at more than 500 upland sites, on approximately 360 miles of streams (i.e., lotic reaches), and at more than 100 seeps/springs (i.e., lentic sites).
As management is modified, the forage allocations will be adjusted accordingly. These adjustments will come through coordinated efforts with ranchers and other interested parties (Escalante MFP RM-1.2).	RM-1.2 (Escalante MFP)	No	This decision needs to be replaced. Allotment evaluations will need to follow the Utah Standards for Rangeland Health and Guidelines for Livestock Grazing management. Land use plan decisions are needed to identify possible grazing management practices that will ensure grazing is compatible with management of GSENM objects and Glen Canyon values and purposes.
Mitigate recreation interactions by fencing recreation sites when developed, and restricting water hauling in Fiftymile Mountain and Paria Canyon recreation lands to existing roads and trails.	RM- 1.1 or RM-1.2 (Paria MFP)	No	Land use plan decisions are needed to set guidelines and criteria for future allotment-specific adjustments in the amount of forage available for livestock, season of use, or other grazing management practices such as structural and nonstructural range improvements.

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
Critical riparian areas that are accessible to livestock will be fenced to keep cattle out (WL-3.1 [of the Zion MFP]).	RM-1.2 (Zion MFP)	Yes	Fencing is one option for protecting riparian areas but there may be other options available that should be explored in the alternatives (e.g., eliminate grazing from those areas or changing season of use).
Improve the condition on suitable and potentially suitable Federal range that is now in poor condition and achieve an upward trend on range that is in a static or downward trend. Increase the production through intensive grazing management and land treatment projects.	RM-2 (Escalante MFP; similar actions are included as RM-2 in the other three MFPs)	No	The classifications (poor, fair, good) for suitable and unsuitable have been replaced by State and Transition models. While the nomenclature is different, the ideas are similar. Update to current standards and practices (i.e., land health standards). This decision may also not be compatible with other decisions in the MMP.
Adjust each grazing allotment in the planning unit to the carrying capacity of the range and adjust the grazing period on the allotments proposed for winter grazing until after seed ripe time for key species as called for in RM-1.1 and RM-1.2 [of the Vermilion MFP].	RM-2.2 (Vermilion MFP)	No	Land use plan level decisions are needed that consider new information such as adoption of the Utah Standards for Rangeland Health and Guidelines for Grazing Management and establishment of GSENM.
Provide for intensive livestock management by construction of developments and facilities.	RM-2.4 (Escalante MFP; similar to RM-2.5 in Vermilion and Zion MFPs)	N/A	Planning-level decisions are needed to identify allowable practices that guide development and maintenance of range improvements to manage livestock uses.
Complete land treatments.	RM-2.5 (Escalante MFP; similar to RM-2.6 in Vermilion and Zion MFPs)	No	There are opportunities to consider additional management direction for nonstructural range improvements (e.g., seedings and chainings). The MMP guides vegetation management but does not include nonstructural range improvements. See Table 4-2, Adequacy of

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
			Current Management and Direction for Vegetation and Options for Change, for nonstructural range improvements.
Continue the unallotted status on Antone Flat, Flag Point, and Varney Griffin by not allocating livestock forage on this area. Protect the relict characteristics of No Man's Mesa.	RM-2.8 (Escalante MFP); RM-3 (Vermilion MFP)	Possibly	These decisions need to be reviewed to determine whether these areas would be available for livestock grazing.
Close the following allotments to grazing and allocate the AUMs to uses other than livestock grazing: Allotment — AUMs Escalante River — 2,422 McGath Point — 60 Saltwater Creek — 120 Steep Creek — 316	Escalante MFP Amendment	Possibly	This action has been completed. Reconsider these allotments as available or unavailable for livestock grazing.
Close to grazing the portion of the Big Bowns Bench (598 AUMs), Deer Creek (83 AUMs), and Phipps (140 AUMs) allotments that are located in the Escalante River. Close the Cottonwood pasture (112 AUMs) of the Deer Creek allotment. The available forage in these areas would be allocated to uses other than livestock grazing.	Escalante MFP Amendment	Possibly	This action has been completed. Reconsider these allotments as available or unavailable for livestock grazing.
Create a grass bank or forage reserve with the remaining AUMs on Phipps allotment (140 AUMs) and all available forage on Little Bowns Bench allotment (130 AUMs) and the Wolverine pasture (148 AUMs) of the Deer Creek allotment This grass bank would only be used during emergencies or for research purposes. Emergencies would include, but would not be limited to drought, insect outbreaks, fire or floods.	Escalante MFP Amendment	Possibly	This action has been completed. Reconsider these allotments as available for livestock grazing, not as forage reserves.

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
Any emergency use would not exceed current authorized use and could occur from October 1 to March 31.			
Use in Horse Canyon would be restricted to that part of the trail going onto Big Bowns Bench to the trail leaving Horse Canyon going onto King Bench. This area would only be used as a holding pasture to gather livestock at the end of the grazing season.	Escalante MFP Amendment	N/A	This action has been completed. Reconsider these allotments as available for livestock grazing, not as forage reserves.
Livestock grazing allotments will be evaluated, and grazing as it relates to all endangered species will be addressed during this process. Evaluations will incorporate the latest research and information in the protection of species. Section 7 consultation will be conducted for all allotments that may affect listed species during the individual allotments evaluations. This process will provide protection for listed and sensitive species as the evaluation will be site specific for each of the allotments	SSA-8 (MMP)	Yes	Ongoing. No change to current management needed.
Actions will be taken to improve identified habitat (Kanab Ambersnail *Oxyloma hadeni kanabensis*) as consistent with the recovery plan objectives. Actions may include assuring flows in appropriate streams and seeps by removing non-native plants affecting the water table and reducing impacts from visitors and/or livestock. Surveys will also identify current habitat and habitat that is potential if modifications are made.	SSA-24 (MMP)	No	The species in GSENM is a nonlisted relative of the noted species. No change to management due to livestock grazing, although the action is no longer relevant.
Grazing permits are also in this category [Valid Existing Rights and Other Land Use Authorizations]. Grazing permits or leases convey no right, title, or	VER-8 (MMP)	Yes	No change.

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
interest in the land or resources used. Although the Proclamation specifically mentions livestock grazing, it does not establish it as a "right" or convey it any new status. The proclamation states that "grazing shall continue to be governed by applicable laws and regulations other than this proclamation," and says that the Proclamation is not to affect existing permits for, or levels of, livestock grazing in the Monument, just as in other BLM livestock grazing administration programs.			
Water developments can be used as a management tool throughout the Monument for the following purposes: better distribution of livestock when deemed to have an overall beneficial effect on monument resources, including water sources or riparian areas, or to restore or manage native species or populations. They can be done only when a NEPA analysis determines this tool to be the best means of achieving the above objectives and only when the water development would not dewater streams or springs. Developments will not be permitted to increase overall livestock numbers. Maintenance of existing development can continue, but may require NEPA analysis and must be consistent with objectives of this Plan.	WDEV-1 (MMP)	Yes	May need to clarify, through education, how decisions to allow new structures would be made according to the existing management direction. Explore opportunity to update this decision to integrate livestock grazing.
Wildlife Services (formerly Animal Damage Control) activities within the Monument will be limited to the taking of individual coyotes within the immediate vicinity after verified livestock kills, where reasonable	WS-1 (MMP)	Yes	No change to current management. Other predators are handled by Utah Division of Wildlife Resources, and coyotes are handled through Animal and Plant Health Inspection

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
livestock management measures to prevent predation had been taken and had failed. Reasonable livestock management measures could include preventative measures to control predation, such as managing where calving occurs, in order to develop improved land management practices.			Services.
Fences may be used in certain circumstances to protect Monument resources, to manage visitor use, and to manage livestock, consistent with the Proclamation. They will be designed and constructed in accordance with visual resource management objectives and the Monument Facilities Master Plan (see the *Visual Resource Management* section [in the MMP] for related decisions).	FENCE-1 (MMP)	Yes	No change to current management.
In developing allocation plans for areas, efforts will be made to coordinate with other resource planning efforts (e.g., research, grazing allotment management plans), as discussed in the implementation and adaptive management framework in Chapter 3 [of the MMP]. This type of integrated activity planning will lead to more comprehensive planning efforts for specific areas and to better decision making.	ALLO-8 (MMP)	Yes	No change to current management.
The BLM will be responsible for administrative routes which will be limited to authorized users. These are existing routes that lead to developments which have an administrative purpose, where the BLM or some permitted user must have access for regular maintenance or operation. These authorized developments include such things as powerlines,	TRAN-15 (MMP)	Yes	No change to current management.

Table 4-1
Adequacy of Current Management Direction for Livestock Grazing and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
cabins, weather stations, communication sites, spring developments, corrals, and water troughs. Routes designated open for certain administrative purposes (approximately 182 miles) are shown on Map 2 [of the MMP]. Access will be strictly limited and will only be granted for legitimate and specific purposes. Maintenance will be the minimum required to keep the routes open for limited use by high clearance vehicles. If the administrative purpose of the route ceases, the route will be evaluated for closure following public notification and opportunity to comment. Authorized users could include grazing permittees, researchers, State or Federal Agencies, Native American Indians accessing recognized traditional cultural properties, and others carrying out authorized activities under a permit or other authorization.			
Beyond the routes shown on Map 2 [of the MMP], the BLM will work with any individual operating within the Monument under existing permits or authorizations to document where access must continue in order to allow operation of a current permit or authorization. Routes that go only to BLM range monitoring and study areas will not be maintained, but periodic vehicular access to these sites will be granted for required range monitoring uses.	TRAN-16 (MMP)	Yes	No change to current management.

4.2 VEGETATION

Table 4-2
Adequacy of Current Management Direction for Vegetation and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
General			
The Monument will be managed to achieve a natural range of native plant associations. Management activities will not be allowed to significantly shift the makeup of those associations, disrupt their normal population dynamics, or disrupt the normal progression of those associations. Additionally, the BLM will work to: • increase public education and appreciation of vegetation through interpretation, • facilitate appropriate research to improve understanding and management of vegetation, and • protect unique vegetation associations such as hanging gardens and relict plant associations	Goal (MMP)	No	The objective does not cover existing seedings, which are not native plant associations. New objectives and actions specific to management of existing seedings are needed. The BLM may also consider new nonstructural range improvements to increase forage using nonnative species.
Vegetation Restoration Methods			
A variety of vegetation restoration methods may be used to restore and promote a natural range of native plant associations in the Monument. Methods and project which do not achieve this objective or which irreversibly impact Monument resources will not be permitted. Vegetation restoration methods fall into four broad categories: mechanical, chemical, biological, and management ignited fires. Each of these methods will be used in accordance with the overall vegetation objectives discussed above, and progress towards these objectives will monitored as part of the adaptive management	Objective (MMP)	Yes	This objective will not change but additional objectives and actions may be added to address existing seedings.

Table 4-2
Adequacy of Current Management Direction for Vegetation and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
framework described in Chapter 3 [of the MMP].			
Mechanical methods, including manual pulling and the use of hand tools (e.g., chainsaws, machetes, pruners) may be allowed throughout the Monument.	RM-1 (MMP)	Yes	This action will not change but additional objectives and actions may be added to address existing seedings.
The use of machinery (e.g., roller chopping, chaining, plowing, discing) may be allowed in all zones except the Primitive Zone. Chaining has been used in the past to remove pinyon and juniper prior to reseeding with perennial grasses. Due to the potential for irreversible impacts to other Monument resources, such as archaeological sites and artifacts, and paleontological resources, this treatment method will not be used to remove pinyon and juniper. It may be allowed to cover rehabilitation seed mixes with soil after wildfires only where: • noxious weeds and invasive non-native species are presenting a significant threat to Monument resources or watershed damage could occur if the burned area is not reseeded, • it can be demonstrated that Monument resources will not be detrimentally affected (i.e., completion of full archaeological, paleontological, threatened and endangered species and other resource clearance and consultation), • it is determined that seed cover is necessary for the growth of the native species proposed for seeding, and • other less surface disturbing measures of covering seed are not available or cannot be applied in a timely manner.	RM-2 (MMP)	No	Opportunities to allow mechanical treatments in all zones should be explored. Treatments appropriate to site types should also be considered.

Table 4-2
Adequacy of Current Management Direction for Vegetation and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
Visual impacts of chaining will also be minimized near routes and other points of concern by covering the native seed mix with harrows or light chains. The GSENM Advisory Committee will be consulted before the use of machinery for treatments is permitted.			
Livestock grazing after native seedings are established will be modified to ensure the survival of the native plants. The livestock exclusion period required to allow full establishment of seeded native species and recovery of surviving native plants after a wildfire may be more than two years. Site evaluation will be required to determine when the native seedings should be grazed again and the effectiveness of the current or new grazing system on the persistence of native plants.	RM-3 (MMP)	No	Clarifications to this action may be needed to allow flexibility.
Chemical methods will generally be restricted to the control of noxious weed species, and are discussed in that section. The use of chemicals may also be allowed in conjunction with research projects and must lead to the achievement of the overall vegetation objectives. These activities will be approved as determined appropriate through consultation with the GSENM Advisory Committee.	RM-4 (MMP)	No	Consider modifying this action to allow for sagebrush control.
With all of the methods described above, vegetation monitoring plots will be established to determine the effectiveness of the treatments in achieving management objectives and to provide baseline data of overall change. This monitoring will include species frequency, density, and distribution data, and will be part of the overall	RM-7 (MMP)	Yes	Monitor vegetation using the AIM core indicators and standard methods, and to set up monitoring in a statistically sound manner to determine if treatment objectives are being met at multiple scales (e.g., local, GSENM-wide, and regional).

Table 4-2
Adequacy of Current Management Direction for Vegetation and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
adaptive management framework described in Chapter 3 [of the MMP].			
Noxious Weed Control			
In addition to strategies for control of established noxious weeds, it is also imperative to reduce the introduction of noxious weed species as stated in Presidential Executive Order (EO 11312) on invasive species. Cooperative programs established for control of these species will also help identify potential new invasions before area-wide establishment has occurred. There are two policies which will help to reduce potential noxious weed introduction. • First, the BLM requires that all hay used on BLM lands be certified weed free. This is a statewide policy which applies to the Monument, as well as all other BLM lands in the State of Utah. • Second is the requirement that all machinery that has been used outside the Monument be cleaned prior to use in the Monument. This provision generally applies to contract equipment used for projects such as construction of facilities and firefighting equipment. Both of these provisions will help reduce the introduction and spread of noxious weed species in the Monument.	NW-7 (MMP)	Yes	Standard operating procedures; no change needed. May need to add actions for undesirable species if it ties back to livestock grazing.
Native vs. Nonnative Plants			
In keeping with the overall vegetation objectives and Presidential EO 11312, native plants will be used as a priority for all projects in the Monument.	NAT-1 (MMP)	Possibly	Include separate action for existing seedings that might include restoring with nonnative species.
Non-native plants may be used in limited, emergency situations where they may be necessary in order to	NAT-2 (MMP)	Possibly	Add language to include existing seedings.

Table 4-2
Adequacy of Current Management Direction for Vegetation and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
protect Monument resources by stabilizing soils and displacing noxious weeds. This use will be allowed to the extent that it complies with the vegetation objectives, Presidential EO 11312, and the *Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah* (1997). In these situations, short-lived species (i.e., nurse crop species) will be used and will be combined with native species to facilitate the ultimate establishment of native species.			
All projects proposed in the Monument will contain a restoration or revegetation component and will budget for the cost of seeding with native species. All planning for projects, in all except limited, emergency situations, will use native species, and the use of non-native species will not be analyzed as an alternative.	NAT-3 (MMP)	Possibly	Consider options for managing existing seedings.
Non-native plants may be used for restoration related research if the use is consistent with and furthers the overall vegetation management objectives, including NAT-2 above, and after consultation with the GSENM Advisory Committee.	NAT-4 (MMP)	Possibly	Consider options for managing existing seedings.
Non-native plants will not be used to increase forage for livestock and wildlife.	NAT-5 (MMP)	Possibly	Consider adding exceptions or alternative management methods for existing seedings.
Monitoring plots will be established in any areas where non-native plants are used in order to document changes in vegetation structure and composition and will be an integral part of the adaptive management framework described in Chapter 3 [of the MMP].	NAT-6 (MMP)	Possibly	Update to address existing seedings.

Table 4-2
Adequacy of Current Management Direction for Vegetation and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
Restoration and Revegetation			
Many factors will be considered when deciding to implement a revegetation or restoration strategy. Each project and area to be treated will be evaluated to determine the appropriate strategy. The following general guidelines can be applied to determine which strategy is the most appropriate and how it will be implemented in order to be consistent with the overall vegetation management objectives. 1. Restoration will be the goal whenever possible (i.e., an attempt will be made to return disturbed areas to conditions which promote a natural array of native plant and animal associations). 2. Species used in both restoration and revegetation projects will comply with the non-native plant policy described above (i.e., native plants will be used as a priority). 3. Revegetation strategies will be used in areas of heavy visitation, where site stabilization is desired. 4. Restoration provisions will be included in all surface disturbing projects including provisions for post restoration monitoring of the area. Costs for these activities will be included in the overall cost of the project and will come out of the entire project budget. 5. Priority for restoration or revegetation will be given to projects where Monument resources are being damaged. These sites will likely be in areas near development and/or heavy visitor use. Although these areas are more likely to be candidates for revegetation	REV-1 (MMP)	Yes	No change to this action is needed. However, a separate set of similar guidance may be needed for existing seedings.

Table 4-2
Adequacy of Current Management Direction for Vegetation and Options for Change

Decision	Planning Decision Number (Source)	Responsive to Current Issues (Y/N)	Remarks (Rationale) and Options for Change
projects, careful evaluation of disturbed sites needs to be conducted to include desired future condition of an area. Restoration or revegetation of areas receiving heavy use may include limits on visitor use in order to promote recovery.			

CHAPTER 5
CONSISTENCY/COORDINATION WITH OTHER PLANS

Section 202 of the FLPMA requires the BLM to coordinate land use planning activities with other federal agencies, and state, local, and tribal governments (FLPMA Section 202[c][9]). The FLPMA states,

> [T]he Secretary shall, to the extent he finds practical, keep apprised of State, local, and tribal land use plans; assure that consideration is given to those State, local, and tribal land use plans that are germane in the development of land use plans for public lands; assist in resolving, to the extent practical, inconsistencies between Federal and non-Federal Government plans, and shall provide for meaningful public involvement of State and local government officials… (FLPMA Section 202[c][9]).

The FLPMA also states, "Land use plans of the Secretary under this section [202] shall be consistent with State and local plans to the maximum extent he finds consistent with Federal law and the purposes of this Act (FLPMA Section 202[c][9])." The BLM planning regulations further clarify that

> Guidance and resource management plans and amendments to management framework plans shall be consistent with officially approved or adopted resource related plans, and the policies and programs contained therein, of other Federal agencies, State and local governments and Indian tribes, so long as the guidance and resource management plans are also consistent with the purposes, policies and programs of Federal laws and regulations applicable to public lands, including Federal and State pollution control laws as implemented by applicable Federal and State air, water, noise, and other pollution standards or implementation plans (43 CFR, Part1610.3-2[a]).

The planning regulations also indicate that where state and local government policies, plans, and programs differ, those of the higher authority will normally be followed (43 CFR, Part 1610.3-2[d]). The multiple use definition in FLPMA (Section 103) means "the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of

the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output."

Prior to the approval of the proposed MMP-A decisions, the Utah State Director will submit to the Governors of Utah and Arizona the proposed MMP-A and will identify any known inconsistencies with the state or local plans, policies, or programs. The Governors have 60 days in which to identify inconsistencies and provide recommendations in writing to the Utah State Director.

If the Governors do not respond within the 60-day period, the MMP-A is presumed to be consistent. If the Governors recommend changes in the proposed MMP-A that were not raised during the public participation process, the Utah State Director will provide the public with an opportunity to comment on the recommendation(s).

If the Utah State Director does not accept the recommendation(s) of the Governors, the Utah State Director will notify the Governors, and the Governors will have 30 days in which to submit a written appeal to the Director of the BLM.

The BLM Director will accept the recommendation(s) of the Governors if the Director determines that they provide for a reasonable balance between the national interest and the states' interest. The BLM Director will communicate to the Governors in writing and publish in the Federal Register the reasons for the decision to accept or reject such Governor's recommendation(s) (43 CFR, Part 1610.3-2[e]).

Plans formulated by federal, state, local, and tribal governments that relate to management of lands and resources have been reviewed for the AMS and will be considered as the MMP-A/EIS is developed. The plans identified include, but are not limited to, those below.

5.1 Federal Agency Plans

Glen Canyon General Management Plan (NPS 1979). This plan specifically identified the following values and purposes for the park unit: vegetation, soils, wildlife, water quality, cultural resources (historic and prehistoric), scenic resources, recreation, and paleontology.

Glen Canyon Grazing Management Plan (NPS 1999). To give further clarity to the Glen Canyon values and purposes with respect to grazing practices across the recreation area, NPS developed a grazing component of the GzMP; it was signed in 1999. This plan's intent was to be a foundational document to give management direction for the future of grazing practices across the recreation area. The GzMP was made to be flexible, allowing new data and methods to be

incorporated into the determinations of park values and resource conditions and the management of livestock practices.

Kanab Field Office Resource Management Plan (BLM 2008b). This RMP provides management direction for the Kanab Field Office. GSENM retains livestock grazing administration responsibility for certain allotments that are in both the Kanab Field Office and GSENM. The Kanab Field Office is responsible for all other aspects of land management as directed by the Kanab RMP.

Arizona Strip Field Office Record of Decision and Resource Management Plan (BLM 2008c). This RMP provides management direction for the Arizona Strip Field Office. GSENM retains livestock grazing administration responsibility for certain allotments that are in both the Arizona Strip Field Office and GSENM. The Arizona Strip Field Office is responsible for all other aspects of land management as directed by the Arizona Strip RMP.

Dixie National Forest Land and Resource Management Plan (Forest Service 1986), as amended. Certain allotments in the decision area extend onto the Dixie National Forest. While the Forest Service is responsible for all management decisions pertaining to the portion of the allotments on the National Forest, the BLM is responsible for permit administration. The BLM coordinates with the Dixie National Forest to maintain a cohesive grazing system on the common allotments.

5.2 State Statutes and Plans

Utah Code, Title 63J Chapter 4, Part 4, Planning. This part describes the duties of the planning coordinator and office.

Utah Code, Title 63J, Chapter 8, State of Utah Resource Management Plan for Federal Lands—Within this chapter, Section 105.8 established the Utah Grazing Agricultural Commodity Zones. The Escalante Region Grazing Zone is one of many grazing zones across Utah. The purpose of these grazing zones are as follows:

1. Preserving and protecting the agricultural livestock industry from ongoing threats
2. Preserving and protecting the history, culture, customs, and economic value of the agricultural livestock industry from ongoing threats
3. Maximizing efficient and responsible restoration, reclamation, preservation, enhancement, and development of forage and watering resources for grazing and wildlife practices and affected natural, historical, and cultural activities

5.3 County Statutes and Plans

Coconino County Comprehensive Plan (adopted 2003). This plan adopted in 2003, is currently being revised. The plan addresses growth, conservation, and development; and includes a section on preserving ranches and ranchlands in the county.

Garfield County General Management Plan (adopted November 8, 2007). This plan establishes criteria, policies, and requirements to be met in the federal land use planning process. It documents baseline conditions for analysis and states where quantified data is not available,

professional judgment must defer to policies and objectives outlined in the Garfield County Resource Management Plan. A 2013 amendment (Resolution 2013-2) addresses the cultural and historic value of grazing and places the Escalante Historic/Cultural Grazing Region on the County Register of Cultural and Historic Resources.

Kane County General Plan (adopted 1998, amended 2014). This plan addresses growth and development and partnerships with federal agencies in Kane County. It was amended in August 2014 to adopt the Escalante Region Multiple Use/Multiple Functions Grazing Zone in response to public concerns on grazing of public lands versus private lands and agricultural pursuits. The Grazing Zone emphasizes the social, economic, historic, and cultural importance of grazing to Kane County and its residents.

Kane County Resource Management Plan (adopted 1998, amended March 2015). This document lays out a series of resource development goals, objectives, and policies that guide the efforts of the Resource Development Committee in coordination with the County Land Use Authority. Both advise the County Commission regarding planning and development issues in a coordinated fashion pertaining to Kane County resource management and this Plan. This plan was also amended with adoption of the Escalante Region Multiple Use/Multiple Functions Grazing Zone.

Kane County Land Use Ordinance, Chapter 27, Escalante Region Multiple Use/Multiple Functions Grazing Zone (last amended September 22, 2014). Chapter 27 of the Kane County Land Use Ordinance establishes the Escalante Region Multiple Use/Multiple Functions Grazing Zone, which overlaps GSENM. The ordinance states that the purpose of providing a multiple use/multiple functions zone are to establish areas that are open and generally undeveloped lands where human habitation would be limited. The zone is designed to enhance and protect land and associated open space resources. It is established to encourage the use of land, where appropriate, for livestock grazing, wildlife habitat, and recreation, among other uses. This zone is established to protect all valid private property rights and the continued use and full access to these rights. This zone is intended to promote the health, safety, convenience, order, prosperity, and general welfare and economy of the inhabitants of Kane County, tourists, and future generations.

5.4 GSENM Proclamation and Objects

Land use planning decisions for National Landscape Conservation System units, such as GSENM, must be consistent with the purposes of the designating proclamation or Act of Congress (BLM Manual 6100, p. 1-6). In addition, land use plans must clearly identify GSENM objects as described in the designating proclamation (BLM Manual 6220, p. 1-12). When the MMP was written, the BLM did not have the specific land use planning guidance for National Landscape Conservation System units that is now provided in BLM Manuals 6100 and 6220. The MMP does not specifically identify GSENM objects.

BLM Manual 6220 Section 1.6.C.2 directs that through the NEPA process, the BLM will analyze whether the impacts of the proposed use in GSENM is consistent with the protection of the area's objects. Section 1.6.G.4 of Manual 6220 states that land use plans must analyze and consider measures to ensure that objects are conserved, protected, and restored. As part the

MMP-A/EIS process, the BLM must identify, assess, and disclose effects on GSENM objects and resources.

GSENM performed an initial assessment as to whether livestock grazing could potentially impact GSENM objects. The results of the preliminary assessment are in Table 5-1, Preliminary Determination of Livestock Grazing Effects on GSENM Objects. This table is a preliminary determination of the effects of livestock grazing on GSENM objects. The BLM evaluated each object and made a determination of “not impacted” or “potentially impacted.” A determination of “not impacted” means that the interdisciplinary team has sufficient information to state that there are not impacts on the object from livestock grazing. A determination of “potentially impacted” means that there are opportunity for livestock grazing to impact the object, whether GSENM-wide or in certain locations, or that sufficient data is not available to make a determination. GSENM will use this initial assessment to begin evaluating the impacts of livestock grazing use on objects. GSENM plans to carry out the evaluation of impacts on GSENM objects as an integral part of the overall NEPA process.

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
General/Social			
Vast and austere landscape	The Grand Staircase-Escalante National Monument's vast and austere landscape embraces a spectacular array of scientific and historic resources. This high, rugged, and remote region, where bold plateaus and multi-hued cliffs run for distances that defy human perspective, was the last place in the continental United States to be mapped. Even today, this unspoiled natural area remains a frontier, a quality that greatly enhances the monument's value for scientific study. The monument has a long and dignified human history: it is a place where one can see how nature shapes human endeavors in the American West, where distance and aridity have been pitted against our dreams and courage. Remoteness, limited travel corridors and low visitation have all helped to preserve intact the monument's important ecological values. The blending of warm and cold desert floras, along with the high number of endemic species, place this area in the heart of perhaps the richest floristic region in the Intermountain West. It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia. Geologic uplift with minimal deformation and subsequent downcutting by streams have exposed large expanses of a variety of geologic strata, each with unique physical and chemical characteristics. These strata are the parent material for a spectacular array of unusual and diverse soils that support many different vegetative communities and numerous types	Not Impacted	Livestock grazing would not alter the vast and austere nature of the landscape of GSENM, such as large natural cliffs and open space value of the geologic formations. The immense scale and the high degree of visual variety in form, line, color, and texture of this landscape allows the typical, modestly scaled, and randomly dispersed developments associated with livestock grazing (e.g., fencing and water developments) to be visually absorbed.

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
	of endemic plants and their pollinators. This presents an extraordinary opportunity to study plant speciation and community dynamics independent of climatic variables. The monument contains an extraordinary number of areas of relict vegetation, many of which have existed since the Pleistocene, where natural processes continue unaltered by man.		
Rugged and remote	This high, rugged, and remote region, where bold plateaus and multi-hued cliffs run for distances that defy human perspective, was the last place in the continental United States to be mapped. Remoteness, limited travel corridors and low visitation have all helped to preserve intact the monument's important ecological values.	Not Impacted	Rugged and remote refers to the geographic location of GSENM. Livestock grazing cannot change the location of GSENM or move it toward travel corridors that make it more accessible.
Unspoiled natural area	Even today, this unspoiled natural area remains a frontier, a quality that greatly enhances the monument's value for scientific study.	Potentially Impacted	While the "unspoiled" nature is recognized, it is also well known that the area is not completely "unspoiled." Livestock grazing has been ongoing for more than 100 years and likely has altered, and likely has the potential to continue to alter, the unspoiled natural area.
Natural processes unaltered by man	The monument contains an extraordinary number of areas of relict vegetation, many of which have existed since the Pleistocene, where natural processes continue unaltered by man.	Not Impacted	These areas remain unaltered by humans because they are not accessible and have not been grazed. See *Relict Plant Communities*.
Frontier	Even today, this unspoiled natural area remains a frontier, a quality that greatly enhances the monument's value for scientific study.	Not Impacted	One definition of "frontier" is "a region that forms the margin of settled or developed territory." The remote and undeveloped character of GSENM is responsible for the existence and quality of most of the scientific and historic

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
			resources described in the Proclamation. Livestock grazing would not alter the frontier location of GSENM.
Scientific study	Even today, this unspoiled natural area remains a frontier, a quality that greatly enhances the monument's value for scientific study. Remoteness, limited travel corridors and low visitation have all helped to preserve intact the monument's important ecological values. The blending of warm and cold desert floras, along with the high number of endemic species, place this area in the heart of perhaps the richest floristic region in the Intermountain West. It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia. Geologic uplift with minimal deformation and subsequent downcutting by streams have exposed large expanses of a variety of geologic strata, each with unique physical and chemical characteristics. These strata are the parent material for a spectacular array of unusual and diverse soils that support many different vegetative communities and numerous types of endemic plants and their pollinators. This presents an extraordinary opportunity to study plant speciation and community dynamics independent of climatic variables. Such diverse objects make the monument outstanding for purposes of geologic study. (See *Geology* section below.)	Potentially Impacted	While the "unspoiled" nature is recognized as enhancing the scientific study value, it is also well known that the area is not completely "unspoiled." Livestock grazing likely has altered, and likely has the potential to continue to alter, the opportunities for scientific study, reducing some and enhancing others (e.g., our ability to study truly "unspoiled" ecosystems is limited, but our ability to study ecosystems responding to human uses and management is enhanced). There would not be an impact on opportunities to study GSENM's geology (see *Geology* section below). There would not be an impact on opportunities to study GSENM's paleontology (see *Paleontology* section below). Livestock grazing could potentially impact archaeological sites (see *Archaeological* section below).

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Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
	The thickness, continuity and broad temporal distribution of the Kaiparowits Plateau's stratigraphy provide significant opportunities to study the paleontology of the late Cretaceous Era. (See *Paleontology* section below.) The area was a contact point for the Anasazi and Fremont cultures, and the evidence of this mingling provides a significant opportunity for archeological study. … Many more undocumented sites that exist within the monument are of significant scientific and historic value worthy of preservation for future study. (See *Archaeological* section below.)		
Long and dignified human history	The monument has a long and dignified human history: it is a place where one can see how nature shapes human endeavors in the American West, where distance and aridity have been pitted against our dreams and courage. The monument is rich in human history. (See *Historic* section below.)	Not Impacted	Grazing does not affect the history of GSENM but may affect archaeological and historic sites (see *Archaeology* and *Historic* sections below).
Geology			
Grand Staircase Upper Paria Canyon System White Cliffs Vermilion Cliffs Kaiparowits Plateau Burning Hills coal	The monument is a geologic treasure of clearly exposed stratigraphy and structures. The sedimentary rock layers are relatively undeformed and unobscured by vegetation, offering a clear view to understanding the processes of the earth's formation. A wide variety of formations, some in brilliant colors, have been exposed by millennia of erosion. The monument contains significant portions of a vast geologic stairway, named the Grand Staircase by pioneering geologist Clarance Dutton, which rises 5,500 feet to	Not Impacted	The geologic features are not affected by grazing, which largely occurs in vegetated areas or bottoms filled with alluvium.

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Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
seams East Kaibab Monocline (the Cockscomb) Circle Cliffs Waterpocket Fold (portion of it) Arches and natural bridges Escalante Natural Bridge Grosvenor Arch Upper Escalante Canyons	the rim of Bryce Canyon in an unbroken sequence of great cliffs and plateaus. The monument includes the rugged canyon country of the upper Paria Canyon system, major components of the White and Vermilion Cliffs and associated benches, and the Kaiparowits Plateau. That Plateau encompasses about 1,600 square miles of sedimentary rock and consists of successive south-to-north ascending plateaus or benches, deeply cut by steep-walled canyons. Naturally burning coal seams have scorched the tops of the Burning Hills brickred. Another prominent geological feature of the plateau is the East Kaibab Monocline, known as the Cockscomb. The monument also includes the spectacular Circle Cliffs and part of the Waterpocket Fold, the inclusion of which completes the protection of this geologic feature begun with the establishment of Capitol Reef National Monument in 1938 (Proclamation No. 2246, 50 Stat. 1856). The monument holds many arches and natural bridges, including the 130-foot-high Escalante Natural Bridge, with a 100 foot span, and Grosvenor Arch, a rare "double arch." The upper Escalante Canyons, in the northeastern reaches of the monument, are distinctive: in addition to several major arches and natural bridges, vivid geological features are laid bare in narrow, serpentine canyons, where erosion has exposed sandstone and shale deposits in shades of red, maroon, chocolate, tan, gray, and white. Such diverse objects make the monument outstanding for purposes of geologic study.		

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
Paleontology			
Late Cretaceous fossils	The thickness, continuity and broad temporal distribution of the Kaiparowits Plateau's stratigraphy provide significant opportunities to study the paleontology of the late Cretaceous Era. Extremely significant fossils, including marine and brackish water mollusks, turtles, crocodilians, lizards, dinosaurs, fishes, and mammals, have been recovered from the Dakota, Tropic Shale and Wahweap Formations, and the Tibbet Canyon, Smoky Hollow and John Henry members of the Straight Cliffs Formation. Within the monument, these formations have produced the only evidence in our hemisphere of terrestrial vertebrate fauna, including mammals, of the Cenomanian-Santonian ages. This sequence of rocks, including the overlaying Wahweap and Kaiparowits formations, contains one of the best and most continuous records of Late Cretaceous terrestrial life in the world.	Not Impacted	Fourteen years of inventory and observation have shown that fossiliferous outcrops and cattle/ranching activity rarely overlap because of the lack of vegetation.
Petrified wood Circle Cliffs	The Circle Cliffs reveal remarkable specimens of petrified wood, such as large unbroken logs exceeding 30 feet in length.	Not Impacted	Fourteen years of inventory and observation have shown that fossiliferous outcrops and cattle/ranching activity rarely overlap because of the lack of vegetation.
Archeological			
Archaeological sites Anasazi cultural sites Fremont cultural sites Rock art panels Occupation sites	Archeological inventories carried out to date show extensive use of places within the monument by ancient Native American cultures. The area was a contact point for the Anasazi and Fremont cultures, and the evidence of this mingling provides a significant opportunity for archeological study. The cultural resources discovered so far in the monument are outstanding in their variety of cultural affiliation, type and distribution. Hundreds of recorded sites include	Potentially Impacted	Many types of archaeological and historic sites can be adversely impacted by direct grazing activities (e.g., trampling, toppling walls, or rubbing), by grazing-exacerbated erosion, and by range-related improvements such as fence lines, corrals, water improvements, and pipelines. This category includes prehistoric and historic sites.

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
Campsites Granaries	rock art panels, occupation sites, campsites, and granaries. Many more undocumented sites that exist within the monument are of significant scientific and historic value worthy of preservation for future study.		
Historic			
Powell Expedition Routes / Sites	John Wesley Powell's expedition did initial mapping and scientific field work in the area in 1872.	Potentially Impacted	No Powell-related sites prone to grazing-related adverse effects are known, but it is possible that such sites might exist. Rock cairns could be affected if livestock topple them. Campsites could also be affected. Observation points would not be affected by livestock grazing.
Mormon Pioneer Trails Inscriptions Ghost towns Old Paria townsite Rock houses Cowboy line camps	Early Mormon pioneers left many historic objects, including trails, inscriptions, ghost towns such as the Old Paria townsite, rock houses, and cowboy line camps, and built and traversed the renowned Hole-in-the-Rock Trail as part of their epic colonization efforts.	Potentially Impacted	Some pioneer-era sites can be adversely impacted by direct grazing activities (e.g., trampling, toppling walls, or rubbing), by grazing-exacerbated erosion, and by range-related improvements such as fence lines, corrals, water improvements, and pipelines. Many of these trails and cowboy line camps are still used and maintained by the permittees for livestock access.
Hole in the Rock Trail	Early Mormon pioneers left many historic objects, including trails, inscriptions, ghost towns such as the Old Paria townsite, rock houses, and cowboy line camps, and built and traversed the renowned Hole-in-the-Rock Trail as part of their epic colonization efforts.	Potentially Impacted	Although the trail itself is probably not subject to adverse grazing-related effects, associated sites, such as campsites and historic inscriptions, could be adversely affected.
Dance Hall Rock National Historic Site	Sixty miles of the [Hole-in-the-Rock] Trail lie within the monument, as does Dance Hall Rock, used by intrepid Mormon pioneers and now a National Historic Site.	Potentially Impacted	The site can be impacted by direct grazing activities, such as rubbing on inscriptions and increased trailing around features.

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
Biological/ Ecological			
Intact ecological values in five lifezones (low-lying desert to coniferous forest)	Spanning five life zones from low-lying desert to coniferous forest, with scarce and scattered water sources, the monument is an outstanding biological resource. Remoteness, limited travel corridors and low visitation have all helped to preserve intact the monument's important ecological values. The blending of warm and cold desert floras, along with the high number of endemic species, place this area in the heart of perhaps the richest floristic region in the Intermountain West.	Potentially Impacted	Grazing has the potential to impact vegetation and water sources throughout the five life zones (see specific vegetation communities and water resources below).
Hanging Gardens Floristic Communities	It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia.	Potentially Impacted	Hanging gardens are typically in remote areas and are made up of ferns and mosses, which have little nutritional value for cattle. They have water, which may attract cattle. Where hanging gardens are accessible, there is the possibility of impact from physical contact.
Tinajas Floristic Communities	It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia.	Potentially Impacted	Most of these communities are inaccessible by livestock. Those that are accessible are often used by livestock as a water source. These areas also provide habitat for micro flora and fauna, especially where sediment forms, which can be impacted by cattle.
Rock Crevice Floristic Communities	It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia.	Potentially Impacted	Where livestock can access these areas, they may eat vegetation growing in rock crevices.

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
Canyon Bottom Floristic Communities	It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia.	Potentially Impacted	These are not a desirable plant community but may be used by livestock.
Dunal Pocket Floristic Communities	It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia.	Not Impacted	These communities form on large dunes that cattle do not access.
Endemic plants and their pollinators	Geologic uplift with minimal deformation and subsequent downcutting by streams have exposed large expanses of a variety of geologic strata, each with unique physical and chemical characteristics. These strata are the parent material for a spectacular array of unusual and diverse soils that support many different vegetative communities and numerous types of endemic plants and their pollinators.	Potentially Impacted	These plant communities are small and they are not a desirable forage species for livestock. However, cattle could graze on these species intermittently.
Relict Plant Communities No Man's Mesa	The monument contains an extraordinary number of areas of relict vegetation, many of which have existed since the Pleistocene, where natural processes continue unaltered by man. These include relict grasslands, of which No Mans Mesa is an outstanding example, and pinyon-juniper communities containing trees up to 1,400 years old. As witnesses to the past, these relict areas establish a baseline against which to measure changes in community dynamics and biogeochemical cycles in areas impacted by human activity. Most of the ecological communities contained in the monument have low resistance to, and slow recovery from, disturbance.	Not Impacted	Relict plant communities are inaccessible to cattle.

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
Pinyon-Juniper Communities with up to 1,400 year old trees	The monument contains an extraordinary number of areas of relict vegetation, many of which have existed since the Pleistocene, where natural processes continue unaltered by man. These include relict grasslands, of which No Mans Mesa is an outstanding example, and pinyon-juniper communities containing trees up to 1,400 years old. As witnesses to the past, these relict areas establish a baseline against which to measure changes in community dynamics and biogeochemical cycles in areas impacted by human activity. Most of the ecological communities contained in the monument have low resistance to, and slow recovery from, disturbance.	Not Impacted	In GSENM, cattle primarily use pinyon-juniper stands for shade and not forage. These areas lack vegetation in the understory such as grasses, forbs, and shrubs that are palatable to cattle. In a study of a historically ungrazed area in GSENM (No Man's Mesa) and an area grazed since the mid-1800s (Deer Springs Point), Barger et al. (2009) found that pinyon-juniper recruitment and growth is more closely correlated with climate patterns than with livestock grazing.
Diversity of wildlife species	The wildlife of the monument is characterized by a diversity of species. The monument varies greatly in elevation and topography and is in a climatic zone where northern and southern habitat species intermingle.	Potentially Impacted	Cattle operations can be beneficial or detrimental to wildlife depending upon how they are managed. Proper grazing and associated infrastructure (e.g., water sources) generally enhance wildlife diversity. This is due to the addition of new watering sources and the creation of some disturbance, which may benefit some species. Seedings and other treatments that alter vegetation and create mosaics generally allow for a greater diversity of wildlife species as more habitats of differing characteristics become available. Where resources are limited, livestock and wildlife may compete for the same resources and limit use by wildlife.
Mountain lion	Mountain lion, bear, and desert bighorn sheep roam the monument.	Potentially Impacted	Mountain lion inhabit remote areas and prey on big game species such as deer and elk. Grazing operations tend to benefit big game species by

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
			providing watering sources. Benefits to big game are also enjoyed by mountain lions that prey on those species. If mountain lions prey on cattle, they can be removed.
Bear	Mountain lion, bear, and desert bighorn sheep roam the monument.	Potentially Impacted	There are very few black bears inhabiting GSENM. Where they exist they are in remote areas and reclusive. Their diet overlaps slightly with cattle due to their omnivorous nature so there may be some competition for forage. Watering sites provided by cattle operations can be beneficial to bears.
Desert bighorn sheep habitat	Mountain lion, bear, and desert bighorn sheep roam the monument.	Potentially Impacted	Bighorn sheep occupy steep, rocky terrain, unreachable by cattle. Their habitat does not overlap with most cattle operations. Watering sites provided by cattle operations can be beneficial to bighorn sheep. If domestic sheep or goats are permitted, there could be an impact on wild sheep depending upon the proximity of domestic and wild sheep. None of the allotments are currently permitted for sheep or goats.
200 bird species	Over 200 species of birds, including bald eagles and peregrine falcons, are found within the area. Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.	Potentially Impacted	Cattle operations can be beneficial or detrimental to birds depending upon how they are managed. Proper grazing and associated infrastructure can enhance bird diversity. This is due to the addition of new watering sources. Seedings (nonstructural range improvements) alter vegetation, which also alters wildlife habitats. Seedings may improve habitat for some avian species while causing a decline in habitat quality for other species.

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
Bald eagles	Over 200 species of birds, including bald eagles and peregrine falcons, are found within the area. Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.	Not Impacted	Bald eagles are seasonal inhabitants of GSENM. They prey mostly on carrion during the winter and are found mostly along roadsides. Cattle operations would have no impact on bald eagles.
Peregrine falcons	Over 200 species of birds, including bald eagles and peregrine falcons, are found within the area. Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.	Potentially Impacted	Peregrine falcons inhabit cliff faces, which are inaccessible by cattle. Watering locations provided by cattle operations can enhance habitat for peregrine falcons due to the fact that water attracts species the birds prey upon.
Neo-tropical Birds in riparian corridors (Paria and Escalante Rivers)	Over 200 species of birds, including bald eagles and peregrine falcons, are found within the area. Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.	Potentially Impacted	Due to the scarcity of water and riparian corridors in GSENM, these areas are important to neo-tropical birds. Cattle are also attracted to riparian areas as they provide water and green forage. Grazing can reduce vegetative cover needed to conceal nesting birds and disturb birds to the point they may abandon a nest. For ground-nesting birds, cattle may trample nests. Proper grazing administration would allow birds to complete their lifecycle requirements.
Riparian corridors	Over 200 species of birds, including bald eagles and peregrine falcons, are found within the area. Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.	Potentially Impacted	Riparian corridors serve as both groundwater discharge and recharge areas. They dissipate energy that would otherwise erode stream channels. Livestock grazing has the potential to alter hydrologic processes, thereby affecting the conditions of the riparian area, its associated stream or river, and the broader landscape.
Cryptobiotic crusts (biological soil crusts)	Fragile cryptobiotic crusts, themselves of significant biological interest, play a critical role throughout the monument, stabilizing the highly erodible desert soils and providing nutrients to plants.	Potentially Impacted	Cattle grazing could impact the health of the biological soil crusts. Fragile cryptobiotic crusts are susceptible to trampling by livestock. Most of GSENM is winter grazing, which has been

Table 5-1
Preliminary Determinations of Livestock Grazing Effects on Monument Objects

Object or Value	Monument Proclamation Language	Determination	Rationale
			found to have less of an impact on the soil crusts. Science is showing that moist soil crusts are more resistant to disturbance.
Packrat middens	An abundance of packrat middens provides insight into the vegetation and climate of the past 25,000 years and furnishes context for studies of evolution and climate change.	Not Impacted	Packrat middens are generally found in crevices, rock piles, jumbled logs, and other hard to access places.
Water sources (streams, springs, seeps, tinajas, wells)	Spanning five life zones from low-lying desert to coniferous forest, with scarce and scattered water sources, the monument is an outstanding biological resource. … It contains an abundance of unique, isolated communities such as…hanging gardens, tinajas… [The water sources include] the Paria and Escalante Rivers and other riparian corridors...	Potentially Impacted	Water on GSENM is limited in both distribution and in quantity. Many of GSENM's water sources are used for or by livestock, and such use has the potential to affect water quantity and quality throughout GSENM.
Unusual and diverse soils	Geologic uplift with minimal deformation and subsequent downcutting by streams have exposed large expanses of a variety of geologic strata, each with unique physical and chemical characteristics. These strata are the parent material for a spectacular array of unusual and diverse soils that support many different vegetative communities and numerous types of endemic plants and their pollinators. This presents an extraordinary opportunity to study plant speciation and community dynamics independent of climatic variables.	Potentially Impacted	Livestock grazing can alter many soil properties and soil stability via compression, devegetation, desertification, and changes in chemistry.
Coniferous forest	Spanning five life zones from low-lying desert to coniferous forest…	Potentially Impacted	Livestock grazing would not impact the larger ponderosa pine trees. Grazing could impact ponderosa pine seedling by reducing competition for resources between other types of vegetation and the seedlings.

5.5 GLEN CANYON ENABLING LEGISLATION AND VALUES AND PURPOSES

In 1972, Congress passed the Glen Canyon's enabling legislation (Public Law 92-593). The Glen Canyon enabling legislation created the recreation area as a unit of the National Park System, managed by the NPS in accordance with the 1916 Organic Act.

The purpose of the recreation area, as described in the enabling legislation, is "to provide public outdoor recreation use and enjoyment of Lake Powell and lands adjacent thereto…and to preserve and protect the scenic, scientific, and historic features contributing to public enjoyment of the area."

The values of Glen Canyon are the "scenic, scientific, and historic features" indicated in the recreation area's enabling legislation of 1972. The 1979 GMP specifically identified the following values and purposes: vegetation, soils, wildlife, water quality, cultural resources (historic and prehistoric), scenic resources, recreation, and paleontology. Grazing, although not a purpose of the recreation area, is a use recognized by Congress in Glen Canyon's enabling legislation.

The enabling legislation specifies that the BLM will administer grazing permits. The BLM accomplishes this task through four offices, including GSENM. GSENM administers grazing on a portion of the recreation area. GSENM applies BLM policies for issuing and administering grazing permits such as the 1934 Taylor Grazing Act (43 USC, Section 315 et seq.) and FLPMA (43 USC 1701 et seq.).

In addition, GSENM administration is subject to Glen Canyon's enabling legislation. Public Law 92-593 states, "the Secretary shall administer, protect, and develop the recreation area in accordance with the provisions of the (Organic) Act of August 25, 1916 (16 USC 1a et seq.), as amended and supplemented, and with other statutory authority available to him for conservation and management of natural resources to the extent he finds such authority will further the purpose of this Act." The Redwoods Act of March 27, 1978 states that in areas of the National Park System, "The authorization of activities...shall not be exercised in derogation of the values and purposes for which these various areas have been established."

To foster coordination between the BLM and the NPS, an Umbrella Memorandum of Understanding for grazing administration within units of the NPS where grazing is authorized was signed by the Directors of the BLM and NPS on September 4, 1984. To implement this Memorandum of Understanding, an Interagency Agreement was executed in 1993 between Glen Canyon and both Utah and Arizona BLM state offices. The intent of this agreement is to "conduct a program to coordinate grazing administration activities on [Glen Canyon] which shall be carried out by the respective BLM District Managers of the Arizona Strip, Cedar City, Richfield, and Moab Districts...and in coordination and cooperation with the Superintendent of [Glen Canyon]." This agreement states that the "BLM has expertise in developing, implementing, and analyzing grazing programs" and that "NPS has expertise in determining whether an activity is consistent with the values and purposes of [Glen Canyon]."

The BLM shall not act on any grazing authorizations, range developments, management plans, management agreements, or resource monitoring and evaluation efforts or approve or act on a change in a grazing permit; change in the kind of livestock; change in the season of use; new construction, reconstruction or major maintenance of existing range

developments/improvements; a new or modified allotment management plan; a new grazing system; or new resource monitoring or evaluation efforts (not covered by an agreed upon plan) until the Superintendent of Glen Canyon has completed a determination regarding the potential effects of the proposed action upon the values and purposes of Glen Canyon. This process is called a "Values and Purposes Determination." The determination requirement is to ensure that grazing activities do not conflict with the protection of resources as called for in the 1916 NPS Organic Act or the Glen Canyon GMP (NPS 1979).

To give further clarity to the Glen Canyon values and purposes with respect to grazing practices across the recreation area, a Grazing Component of the GzMP was developed and signed in 1999 (NPS 1999). This plan's intent was to be a foundational document to give management direction for the future of grazing practices across the recreation area. It was made to be flexible, allowing new data and methodologies to be incorporated into the determinations of park values and resource conditions and the management of livestock practices.

The 1999 GzMP identifies specific value statements for each fundamental recreation area resource. It includes resource values, goals, and objectives for vegetation, soils, water quality, wildlife, cultural resources, paleontological and quaternary resources, scenic resources, and recreational resources. Resource management goals and 34 resource objectives were also developed with the assistance of local BLM offices that would comply with the intent of the NPS Organic Act and Glen Canyon's enabling legislation and help achieve each resource value. It is against these 34 objectives that approval of any proposed grazing activity across the recreation area, via a Values and Purposes Determination, is based. See Chapter 3, Current Management Direction, for pertinent management direction from the GzMP.

In addition, NPS management policies provide additional guidance to all NPS units, including Glen Canyon (NPS 2006).

CHAPTER 6
SPECIFIC MANDATES AND AUTHORITY

The foundation of public land management is in the mandates and authorities provided in laws, regulations, and executive orders. The BLM planning process (as described in 43 CFR, Part 1600) is authorized and mandated through two important laws: the FLPMA and the National Environmental Policy Act of 1969. In addition to these laws, several other laws, Instructional Memoranda, manuals, and handbooks give direction and authority to the BLM. The following are some of the documents that direct the management of public lands and resources in the decision area.

6.1 GENERAL

Federal Laws and Regulations

- Antiquities Act of 1906
- NPS Organic Act of 1916 (16 USC 1)
- Migratory Bird Treaty Act of 1929
- National Historic Preservation Act of 1966 (Public Law 89-655; 80 Stat. 915)
- Redwoods National Park Act of 1968, as amended (Public Law 90-545: 16 USC 79a)
- National Environmental Policy Act of 1969, as amended (Public Law 90-190)
- Clean Air Act of 1970 (42 USC 7401 et seq.)
- Endangered Species Act of 1973, as amended (Public Law 93-205; 87 Stat. 884; 16 USC 1531-1543)
- Federal Land Policy and Management Act of 1976 (Public Law 94-579)
- Archeological Resources Protection Act of 1979 (Public Law 96-95; 16 USC 470aa, et seq.)
- Paleontological Resources Protection Act of 2009
- Omnibus Public Land Management Act of 2009
- Glen Canyon enabling legislation (Public Law 92-593) to established Glen Canyon

- Presidential Proclamation 6920 to established GSENM
- CEQ regulations (40 CFR, Parts 1500-1508)
- Resources Management Planning regulations (43 CFR, Part 1610)
- National Park Service Authorities Act (Public Law 94-458: 90 Stat. 1939; 16 USC la, et seq.)

BLM Policy

- Utah BLM Standards for Rangeland Health and Guidelines for Livestock Grazing Management (1997). Utah BLM's Standards for Rangeland Health and Guidelines for Grazing Management were developed in accordance with 43 CFR, Part 4180 to provide for conformance with the Fundamentals of Rangeland Health. Through conformance and attainment of Utah's Standards and Guidelines, the Utah BLM assures that the Fundamentals of Rangeland Health are met. Standards describe the desired condition of the biological and physical components and characteristics of rangelands. Guidelines are the grazing management approaches, methods, and practices that are indented to achieve a Standard.
- Secretarial Order 3308, Management of the National Landscape Conservation System (November 15, 2010). This order furthers the purposes of the Omnibus Public Land Management Act of 2009, which established the National Landscape Conservation System under the jurisdiction of the BLM. The purpose of the National Landscape Conservation System is to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations. It directs the BLM to manage components of the National Landscape Conservation System to protect the values for which they were designated, including prohibiting uses that are in conflict with the unit's values. Where consistent with such protection and with applicable laws, multiple uses may be allowed.
- Manual 6100, National Landscape Conservation System Management (2012). The purpose of this manual is to provide general policy to BLM personnel on managing public lands in the National Landscape Conservation System according to the Omnibus Public Land Management Act of 2009.
- Manual 6220, National Monuments, National Conservation Areas, and Similar Designations (2012). This manual provides guidance to BLM personnel on managing public lands that are components of the National Landscape Conservation System and that have been designated by Congress or the President as National Monuments, National Conservation Areas, or similar designations.
- Manual 6330, Management of Wilderness Study Areas (2012). The manual outlines procedures to ensure the Congressional mandate to manage wilderness study areas so as not to impair the suitability of such areas for preservation as wilderness will be met.
- Handbook H-1790-1, National Environmental Policy Act (BLM 2008a). The purpose of the NEPA Handbook is to help BLM comply with the NEPA, the CEQ's NEPA

regulations (40 CFR, Parts 1500–1508) and the Department of the Interior NEPA manual.

- Handbook H-1601-1, Land Use Planning Handbook (BLM 2005). The BLM Land Use Planning Handbook provides supplemental guidance for implementing the BLM land use planning requirements established by Sections 201 and 202 of the FLPMA (42 USC 1711-1712) and the regulations at 43 CFR, Part 1600. It provides guidance for preparing or amending BLM land use plans.
- Manual 4180, Land Health (2009). This manual establishes policy, provides guidelines, and assigns management structure and responsibilities for conducting land health evaluations.
- Handbook H-4180-1, Rangeland Health Standards (2001). This handbook gives specific direction for implementing the policies listed in the BLM Manual 4180. It describes the authorities, objectives, and policies that guide the implementation of the Healthy Rangeland Initiative.
- Handbook H-4400-1, Rangeland Monitoring and Evaluation (1989). This handbook provides guidance related to monitoring and evaluation plans, monitoring schedules, coordination, training, and sampling.
- Healthy Lands Initiative. The Healthy Lands Initiative is a major vegetation resources enhancement initiative to restore and improve the health and productivity of western public lands. The strategy increases the effectiveness and efficiencies of vegetation enhancement treatments by focusing on treatments on a significant percentage of lands rather than at the project level.
- IM 2009-007, Process for Evaluating Status of Land Health and Making Determinations of Causal Factors When Land Health Standards Are Not Achieved. This policy establishes requirements for the work that must be completed before the BLM Authorized Officer signs a determination document that identifies significant causal factors for not achieving land health standards. It provides an updated procedure for evaluating land health, making determinations, and developing appropriate actions that will make significant progress toward achieving land health standards developed in accordance with 43 CFR, Part 4180.2(c).
- Assessment, Inventory, and Monitoring (AIM) Strategy (Toevs et al. 2011, Information Bulletin No. 2012-080). The AIM Strategy establishes a framework for collection of monitoring data that is consistent and compatible across scales, programs, and administrative boundaries. Implementation of the AIM Strategy will provide defensible, quantitative data to inform decisions and allow data to be collected once and used many times for many purposes.

NPS Policy

- NPS Management Policies (2006). The NPS Management Polices is a guide to managing the National Park System. Applicable sections include the following:
  - Section 1.4, Park Management. Discusses the prohibition on impairment

- Section 5.2, Planning (Cultural Resource Management). Discusses requirements for consideration of cultural resources during planning, including consultation requirements
- Section 6.3, Wilderness Resource Management
- Section 8.1.2, Process for Determining Appropriate Uses

- Director's Order 12, Environmental Impact Analysis. This Director's Order and associated handbook contains the basic information needed for meeting the legal requirements of the NEPA. Section 2.7 offers guidance on defining and examining alternatives.
- Director's Order 28, Cultural Resources Management. This Director's Order offers guidance in applying policies to establish, maintain, and refine park cultural resource programs and refers users to the variety of technical manuals, handbooks, and other sources for specific program areas. Chapter 6, Section 5 states that, in accordance with the NEPA, at the earliest possible stage of planning, it must be determined (1) whether and at what level the proposed project area has been surveyed archeologically, (2) whether archeological resources eligible for the National Register have been identified in the area, and (3) whether such resources will be affected by the proposed project.
- Director's Order 41, Wilderness Stewardship. This Director's Order offers guidance for wilderness stewardship in eligible, proposed, recommended, and designated wilderness areas. Section 6 describes wilderness preservation, including scientific values, effects of climate change, and cultural resources, which are also identified in planning issues for this MMP-A/EIS.
- Director's Order 46, Wild and Scenic Rivers. This Director's Order provides policy guidance necessary for accountability, consistency and continuity in the implementation of the Wild and Scenic Rivers Act, which was passed to protect selected rivers from dams, diversions, channelization, and other projects that would result in impacts on various resources (including water quality and wildlife, scenic, or recreational resources). Section 4.1 describes these impacts and resources and states NPS responsibilities in accordance with this act.
- Director's Order 53, Special Park Uses. This Director's Order sets forth the policies and procedures for administering special park uses on NPS-managed lands, which includes grazing. Section 10.5 provides guidance for domestic livestock management in parks that permit livestock use.
- Director's Order 75A: Civic Engagement and Public Involvement. This Director's Order articulates the NPS's commitment to civic engagement and public involvement that reinforces preservation for cultural and natural resources. Among the entities that the NPS considers are recreational user groups. Section VI describes policies and standards that the NPS will uphold to support this Director's Order, which includes public involvement in decision-making.
- Director's Order 79, Integrity of Scientific and Scholarly Activities. This Director's Order establishes scientific and scholarly ethical standards, including a code of

conduct, to ensure scientific integrity of NPS activities. Section IV details the Code of Scientific and Scholarly Conduct, which will be adhered to during alternative development and analysis.

- Director's Order 83, Public Health. The purpose of this Director's Order is to outline what NPS will do to ensure compliance with prescribed public health policies, practices and procedures. Depending on what is considered in the MMP-A/EIS, sections that could be consulted include: Section D, Recreational Waters; Section F, Backcountry Operations; and Section G, Vectorborne and Zoonotic Diseases.

Interagency Agreements

- NPS-BLM Memorandum of Understanding on grazing management (1984). This sets up the working relationship between the BLM and NPS for grazing management within Glen Canyon. Under the memorandum, the BLM is responsible for grazing administration and NPS is responsible for ensuring that proposed grazing activities are consistent with the purposes for which the area was established.
- NPS-BLM Interagency Agreement on grazing management (1993). The NPS must provide the BLM with terms and conditions regarding grazing to ensure compatibility with Glen Canyon's values and purposes.

6.2 Livestock Grazing

In addition to the general mandates and authorities described above, the following apply specifically to livestock grazing administration.

Federal Laws and Regulations

- Taylor Grazing Act of 1934 (43 USC, Sections 315, 315a to 315r)
- Public Rangelands Improvement Act of 1978 (43 USC, Section 1901 et seq.)
- 43 CFR, Part 4100, Grazing Administration
- Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration (43 CFR, Part 4180).

BLM Policy

- IM 2012-169, Resource Management Plan Alternative Development for Livestock Grazing. Provides guidance for developing livestock grazing alternatives during land use planning.
- Manual 4100, Grazing Administration (2009). This sets forth the objectives, responsibilities, and polices for livestock grazing administration on BLM-managed lands, exclusive of Alaska.
- Handbook H-4120-1, Grazing Management (1987). This describes cooperative management agreements, allotment management plans, range improvements, cooperation with government agencies, and special rules as they pertain to livestock grazing on BLM lands.

NPS Policy

- NPS Management Policies (2006), Section 8.6.8.2, Managing Agricultural Grazing. This describes when the NPS permits grazing within a park and which regulations must apply.

6.3 VEGETATION

In addition to the general mandates and authorities described above, the following apply specifically to vegetation management.

Federal Laws and Regulations

- Federal Noxious Weed Act (7 USC, Section 2801 et seq.)

BLM Policy

- Manual 1737, Riparian – Wetland Management (1992). This establishes the process for assessing PFC.
- IM UT-2005-091, Attachment 1, Utah Riparian Management Policy. This states that riparian areas will be maintained in or improved to PFC.
- Handbook H-1740-2, Integrated Vegetation Management H-1740-2 (2008). This guides implementation of vegetation management planning and treatment activities to achieve the objectives set forth in Manual 1740, Renewable Resource Improvements and Treatments (2008). These objectives include adding policy on maintaining and restoring native plant community diversity, resiliency, and productivity.

NPS Policy

- Director's Order 77-1, Wetland Protection. The purpose of this Director's Order is to establish NPS policies, requirements, and standards for implementing Executive Order 11990, Protection of Wetlands. Section 2 describes these policies, requirements, and standards.
- Director's Order 77-7, Integrated Pest Management Manual. This provides descriptions of the biology and management of 21 species or categories of pests.

Miscellaneous

- Executive Order 11990, Protection of Wetlands (May 24, 1977)
- Executive Order No. 13112: Invasive Species, 1999
- DOI Manual 520, Chapter 1, Floodplain Management and Wetlands Protection Procedures (2000). This sets forth the procedures to be followed in implementing Executive Order 11988, Floodplain Management and Executive Order 11990, Protection of Wetlands.

6.4 WATER

In addition to the general mandates and authorities described above, the following apply specifically to water resources management.

Federal Laws and Regulations

- The Federal Water Pollution Control Act, 33 USC, Section 1251 et seq., as amended, commonly referred to as the Clean Water Act, establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.
- The Safe Drinking Water Act, 42 USC, Section 300 et seq., is the main federal law that ensures the quality of the nation's drinking water.

BLM Policy

- IM UT-2015-019, Utah Senate Bill 274 Regarding Livestock Water Rights. This provides policy and guidance updates precipitated by changes to Utah Code, Section 73-3-31, when Utah Senate Bill 274 was signed into law. This IM sets forth procedures for obtaining BLM water rights for use in its livestock grazing program, for responding to water rights applications filed by grazing permittees, and for deciding whether BLM funds should be expended on construction of livestock water developments.
- Manual 7240, Water Quality Manual (2015). This establishes policies and guidance and assigns responsibilities for the BLM stewardship of water resources, including protecting, restoring, and maintaining the quality of waters on National System of Public Lands.
- Manual 7250, Water Rights Manual (2013). This establishes policy and guidance for the BLM in locating, perfecting, documenting, and protecting BLM-managed water rights, which are considered property rights, necessary to manage and conserve the economic and resource values of the public lands.

NPS Policy

- Director's Order 77-2, Floodplain Management. The purpose of this Director's Order is to establish NPS policies, requirements, and standards for implementing Executive Order 11988, Floodplain Management, which was issued "to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." Section 5.0 describes the procedures that NPS must carry out for proposed actions in order to comply with this policy, which includes classification, a statement of findings (involving an investigation of alternative sites), and an approval process.
- Reference Manual 83A1, Drinking Water. NPS Unit Managers will reduce the risk of waterborne diseases and provide safe drinking water to employees, the visiting public, and park partners by assuring that drinking water systems are properly operated, maintained, monitored, and deficiencies promptly corrected.

6.5 SOIL

In addition to the general mandates and authorities described above, the following apply specifically to soil resources management.

Federal Laws and Regulations

- Soil and Water Resources Conservation Act of 1977. This provides for conservation, protection and enhancement of soil, water, and related resources

BLM Policy

- Manual 7100, Soil Resource Management (2008). This defines the policy of the BLM's Soil Resource Management Program.

6.6 RECREATION

In addition to the general mandates and authorities described above, the following apply specifically to recreation management.

Federal Laws and Regulations

- Federal Lands Recreation Enhancement Act (2004). This creates common definitions, policy guidance, and reporting for agencies involved in recreation management.

BLM Policy

- Manual 8320 (Planning for Recreation and Visitor Services) (2011). Provides planning policy for recreation and visitor services on BLM lands.

CHAPTER 7
LIST OF PREPARERS

This AMS was prepared by an interdisciplinary team of staff from the BLM and Environmental Management and Planning Solutions, Inc. (EMPSi). The following people prepared or contributed to the development of the AMS.

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Richard Madril	Assistant Monument Manager: Resources	AS, Agricultural Economics: Farm and Ranch Business Management; BS, Agricultural Science, Animal Production, Minor Range and Natural Resources	28
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CHAPTER 8 GLOSSARY

Active use. That portion of the grazing preference that is: 1) available for livestock grazing use under a permit or lease based on livestock carrying capacity and resource conditions in an allotment; and 2) not in suspension (43 CFR, Part 4100.0-5).

Actual use. Where, how many, what kind or class of livestock, and how long livestock graze on an allotment, or on a portion or pasture of an allotment (43 CFR, Part 4100.0-5).

Allotment. An area of land designated and managed for grazing of livestock (43 CFR, Part 4100.0-5).

Allotment management plan. A documented program developed as an activity plan, consistent with the definition at 43 USC 1702(k), that focuses on, and contains the necessary instructions for, the management of livestock grazing on specified public lands to meet resource condition, sustained yield, multiple use, economic and other objectives (43 CFR, Part 4100.0-5).

Animal unit month (AUM). The amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month (43 CFR, Part 4100.0-5).

Available (for livestock grazing). Public lands where a land use plan decision has been made that identified livestock grazing use as an allowable use. In other words, a land use plan decision indicates that areas are open to livestock grazing use.

Benthic. Of, relating to, or occurring at the bottom of a body of water.

Ecological site. A distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.

Ecoregion. Areas identified through the analysis of the patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity. These phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The relative importance of each characteristic varies from one ecological region to another regardless of the hierarchical level.

Fundamentals of rangeland health. Overarching principles of rangeland health, listed at 43 CFR, Part 4180.1, which establish the Department's policy of managing for healthy rangelands (60 Federal Register at 9954). State or regional standards and guidelines must provide for conformance with the Fundamentals of Rangeland Health (43 CFR, Part 4180.2[b]).

Grazing lease. A document that authorizes grazing use of the public lands under Section 15 of the Taylor Grazing Act. A grazing lease specifies grazing preference and the terms and conditions under which lessees make grazing use during the term of the lease (43 CFR, Part 4100.0-5).

Grazing permit. A document that authorizes grazing use of the public lands under Section 3 of the Taylor Grazing Act. A grazing permit specifies grazing preference and the terms and conditions under which permittees make grazing use during the term of the permit (43 CFR, Part 4100.0-5).

Grazing preference. The total number of animal unit months on public lands apportioned and attached to base property owned or controlled by a permittee, lessee, or applicant for a permit or lease. Grazing preference includes active use and use held in suspension. Grazing preference holders have a superior or priority position against others for the purpose of receiving a grazing permit or lease (43 CFR, Part 4100.0-5).

Guideline. A practice, method, or technique determined to be appropriate to ensure that standards can be met or that significant progress can be made toward meeting the standard. Guidelines are tools such as grazing systems, vegetative treatments, or improvement projects that help managers and permittees achieve standards. Guidelines may be adapted or modified when monitoring or other information indicates the guideline is not effective, or a better means of achieving the applicable standard becomes appropriate (BLM Handbook H-4180-1).

Invasive plants. Plants that are not part (if exotic) of or are a minor component (if native) of the original plant community or communities that can become a dominant or co-dominant species on the site if their future establishment and growth is not actively controlled by management interventions, or are classified as exotic or noxious plants under state or federal law. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants (BLM Handbook H-1740-2, Integrated Vegetation Management).

Inventory. Gathering of baseline information (including quantitative data, cultural knowledge, and qualitative observations) about condition of resources. Examples of inventory are ecological site inventory and population counts of threatened or endangered species (BLM Handbook H-4180-1).

Land health. Degree to which the integrity of the soil and the ecological processes of ecosystems are sustained (BLM Handbook H-4180-1).

Land use plan. A resource management plan, developed under the provisions of 43 CFR, Part 1600, or a management framework plan. These plans are developed through public participation in accordance with the provisions of the Federal Land Policy and Management Act of 1976 (43

USC 1701 et seq.) and establish management direction for resource uses of public lands (43 CFR, Part 4100.0-5).

Lentic. Standing water habitat such as lakes, ponds, seeps, bogs, and meadows.

Livestock carrying capacity. The maximum stocking rate possible without damaging vegetation or related resources. The rate may vary from year to year in the same area as a result of fluctuating forage production (43 CFR, Part 4100.0-5).

Lotic. Running water habitat such as rivers, streams, and springs.

Monitoring. The periodic observation and orderly collection of data to evaluate: 1) effects of management actions; and 2) effectiveness of actions in meeting management objectives (43 CFR, Part 4100.0-5).

Nonnative Invasive Species. An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112).

Noxious weed: A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the US (BLM Handbook H-1740-2, Integrated Vegetation Management).

Range improvement. An authorized physical modification or treatment which is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; restore, protect and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical devices or modifications achieved through mechanical means (43 CFR, Part 4100.0-5).

Rangeland health. The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained. Rangeland health exists when ecological processes are functioning properly to maintain the structure, organization, and activity of the system over time (BLM Handbook H-4180-1).

Rangeland health assessment. The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained. Rangeland health exists when ecological processes are functioning properly to maintain the structure, organization and activity of the system over time. A three-step process is used to determine whether rangeland health standards are being met on BLM-managed lands:

- *Assessment***.** The estimation or judgment of the status of ecosystem structures, functions, or processes, within a specified geographic area (preferably a watershed or a group of contiguous watersheds) at a specific time. An assessment is conducted by gathering, synthesizing, and interpreting information, from observations or data from inventories and monitoring. An assessment characterizes the status of resource conditions so that the status can be evaluated (see definition of evaluation)

relative to land health standards. An assessment sets the stage for an evaluation. An assessment is not a decision.

- *Evaluation.* An evaluation is conducted to arrive at two outcomes. Firstly, an evaluation conducts an analysis and interpretation of the findings resulting from the assessment, relative to land health standards, to evaluate the degree of achievement of land health standards. Secondly, an evaluation conducts an analysis and interpretation of information—be it observations or data from inventories and monitoring—on the causes for not achieving a land health standard. An evaluation of the causes provides the foundation for a determination (see definition for determination). An evaluation goes further than an assessment because an evaluation takes what the assessment provides–which is the status of resource conditions characterized by the appropriate indicators–and evaluates them according to land health standards. Then, this leads to a prognosis of: land health standard achieved; making significant progress toward achieving a land health standard; or land health standard not achieved. If the land health standard is not achieved, the evaluation of the causes allows a determination to be made. In summary, an evaluation builds on the assessment, and the evaluation sets the stage for a determination.
- *Determination.* Document recording the BLM Authorized Officer's finding that existing grazing management practices or levels of grazing use on public lands grazing either are or are not significant factors in failing to achieve the standards and conform with the guidelines within a specified geographic area (preferably watershed or a group of contiguous watersheds). (BLM H-4180-1.)

Riparian area: A form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along, next to, or contiguous with perennially and intermittent flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels are typical riparian areas (Leonard et al. 1992, p. 7).

Special recreation management area (SRMA). An area of BLM-managed land where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation (BLM Manual 8320). SRMAs are designated in land use plans.

Standard. Standards of land health are expressions of levels of physical and biological condition or degree of function required for healthy lands and sustainable uses, and define minimum resource conditions that must be achieved and maintained (BLM Handbook H-4180-1).

Stocking rate. The number of specific kinds and classes of animals grazing or utilizing a unit of land for a specific period of time. It may be expressed as animals per acre, hectare, or section or the reciprocal (area of land per animal). When dual use is practiced (e.g., cattle and sheep), the stocking rate is often expressed as animals per unit of land or the reciprocal (NRCS 2003, p. Glossary-55).

Suspension. The withholding from active use through a decision issued by the authorized officer or by agreement of part or all of the grazing preference specified in a grazing permit or lease (43 CFR, Part 4100.0-5).

Temporary nonuse. That portion of active use that the authorized officer authorizes not to be used, in response to an application made by the permittee or lessee (43 CFR, Part 4100.0-5).

Trend. The direction of change over time, either toward or away from desired management objectives (43 CFR, Part 4100.0-5).

Unalloted. Public lands open to grazing which currently have no livestock grazing authorized.

Unavailable (for livestock grazing). Public lands where a land use plan decision has been made to close lands to livestock grazing use.

Utilization. The portion of forage that has been consumed by livestock, wild horses and burros, wildlife, and insects during a specified period. The term is also used to refer to the pattern of such use (43 CFR, Part 4100.0-5).

Wetland: Those areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (US Army Corps of Engineers 1987, p. 9).

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CHAPTER 9
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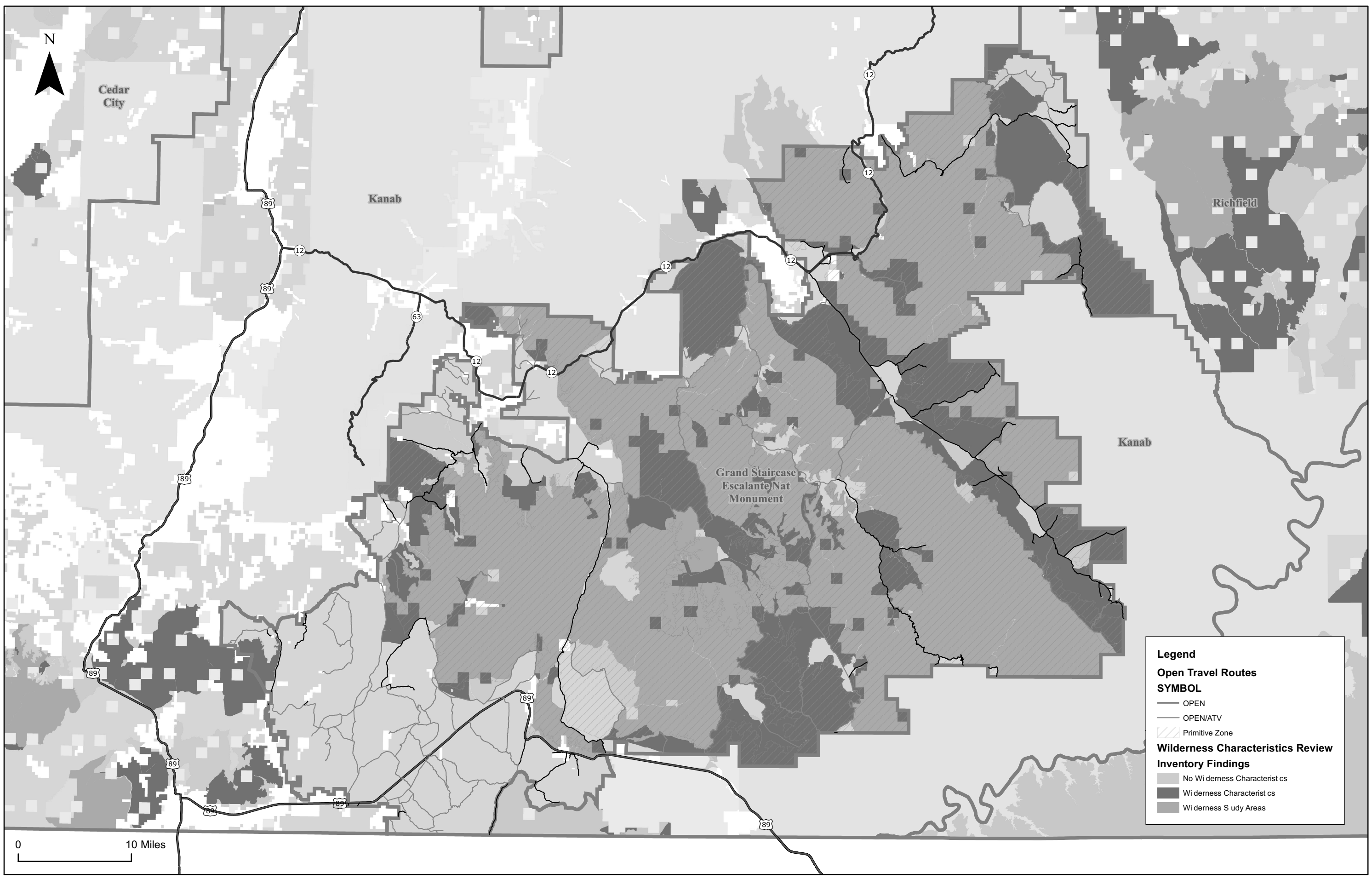

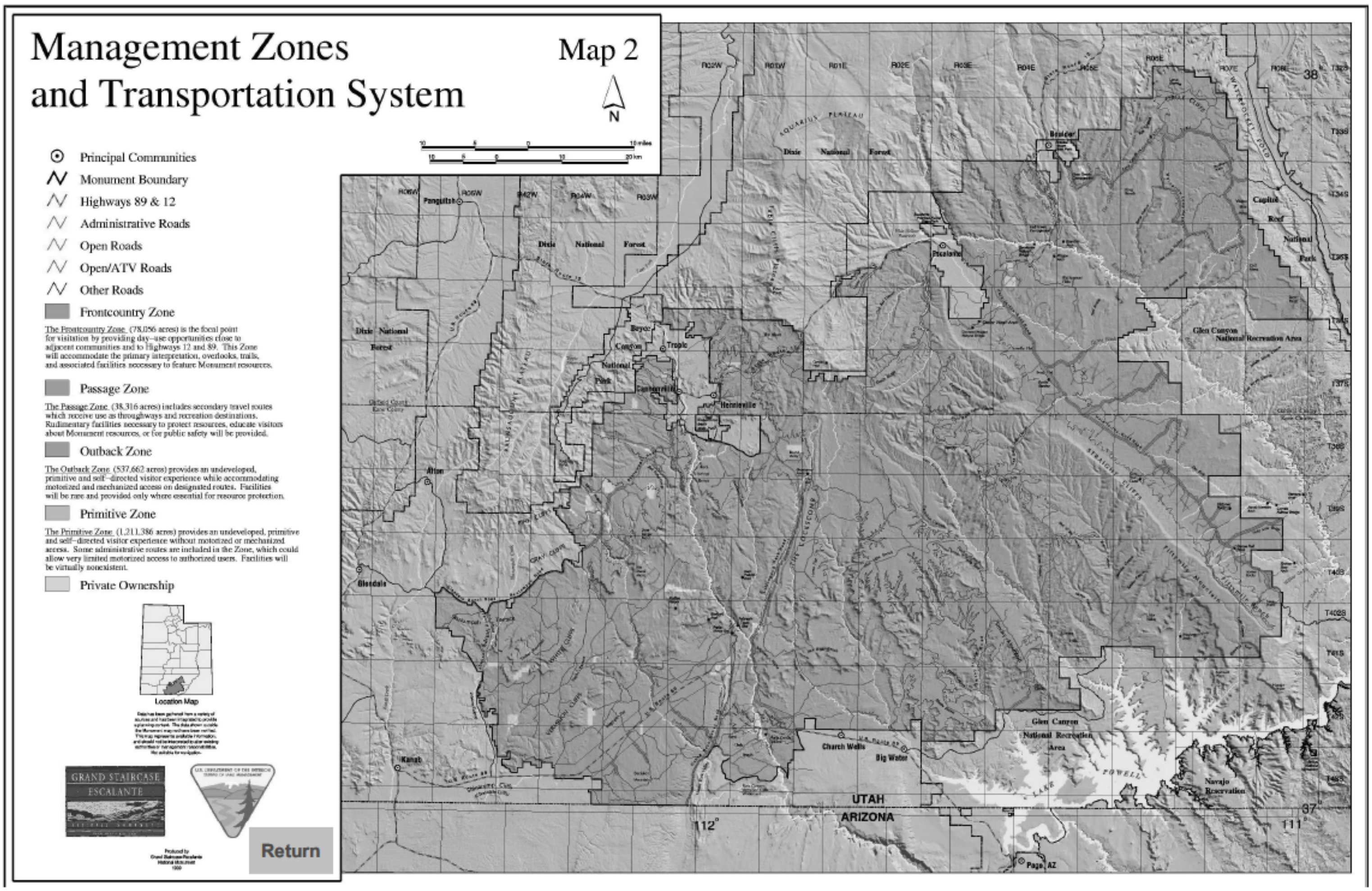
Management Zones
and Transportation System
Map 2
N
Principal Communities
Monument Boundary
Highways 89 & 12
Administrative Roads
Open Roads
Open/ATV Roads
Other Roads
Frontcountry Zone
The Frontcountry Zone (78,056 acres) is the focal point for visitation by providing day-use opportunities close to adjacent communities and to Highways 12 and 89. This Zone will accommodate the primary interpretation, overlooks, trails, and associated facilities necessary to feature Monument resources.
Passage Zone
The Passage Zone (38,316 acres) includes secondary travel routes which receive use as throughways and recreation destinations. Rudimentary facilities necessary to protect resources, educate visitors about Monument resources, or for public safety will be provided.
Outback Zone
The Outback Zone (537,662 acres) provides an undeveloped, primitive and self-directed visitor experience while accommodating motorized and mechanized access on designated routes. Facilities will be rare and provided only where essential for resource protection.
Primitive Zone
The Primitive Zone (1,211,386 acres) provides an undeveloped, primitive and self-directed visitor experience without motorized or mechanized access. Some administrative routes are included in the Zone, which could allow very limited motorized access to authorized users. Facilities will be virtually nonexistent.
Private Ownership
Location Map
Return
Dixie National Forest
Boulder
Escalante
Tropic
Henrieville
Cannonville
Bryce Canyon National Park
Capitol Reef National Park
Glen Canyon National Recreation Area
Alton
Glendale
Kanab
Church Wells
Big Water
UTAH
ARIZONA
Page, AZ
Navajo Reservation
Lake Powell
112°
111°
37°
38